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How Much Control of Tuberculosis?*

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THE impetus for the modern campaign against tuberculosis came from Koch's discovery of the tubercle bacillus and his demonstration of its necessary rôle in the causation of the disease. From his evidence the inference was plain that the disease could be prevented if infection with the tubercle bacillus could be avoided. There was then, and there has been since, no reason to doubt the soundness of the thesis that complete protection against exposure to the tubercle bacillus would completely prevent tuberculosis; but there has been and is still grave doubt as to whether it is practicable to set up and maintain protective measures which will be sufficient to give this result.

The years that have elapsed since the campaign began have extended our knowledge of tuberculosis in every direction. They have brought improvements of great importance in methods of diagnosis and treatment, and have seen the building up of a tremendous machinery for the care of the tuberculous. But they have not brought forth any really new principle of prevention; they have produced no well proved and dependable method for lasting and effective specific immunization by artificial means and no simple specific cure for the disease. Thus, while organization and weapons have been improved, the essential strategy of the attack against tuberculosis remains the same as it was 50 years ago. The main objective is still avoidance of exposure, and the strategy is still that of a frontal assault on discoverable sources of infection. From the standpoint of prevention, curative treatment and measures designed to increase resistance to infection may be regarded as supplementary.

If we could measure the success of this strategy by the decline in mortality from tuberculosis, the results must be considered gratifying beyond expectation, for in this country, and quite generally in others where the progress of civilization has been comparable, mortality has steadily declined. For instance, in that part of the United States for which we have

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continuous mortality statistics since 1900—an area made up largely of the northeastern states—the crude mortality rate from tuberculosis in 1933 was less than one-third of the rate in 1900. And, what is still more gratifying, the rate of decline has been more rapid in the latter than in the early years of this period.

There are, however, many and sound reasons for doubting that the general and rapid decline of tuberculosis during the last 50 years has been due *principally* to the measures which have been taken for the specific purpose of preventing infection. To mention only a few of these reasons; it is readily apparent that even in areas best provided with sanatorium facilities the isolation of open cases of tuberculosis is far from complete. Also, as has often been pointed out, the decline in mortality is not limited to those areas in which vigorous control measures have been carried out and when studied broadly shows no clear correlation with the extent of these measures. There is also conclusive evidence that although tuberculosis as a manifest disease has declined greatly, tuberculous infection remains high. It has not been uncommon in recent years to find, in cities, that more than one-half of the children attending public schools show evidence of infection (that is, a positive tuberculin reaction) before they have passed the age of 15, and that of adults past 30 few indeed remain uninfected.[1]

Moreover, the general doctrine that communicable disease may be prevented satisfactorily by avoidance of infection has fallen somewhat into disrepute as applied to those diseases which, like tuberculosis, are transmitted directly from person to person by way of the respiratory tract. The physical difficulties in the way of preventing this kind of person-to-person transmission are obvious enough; and, as bacteriological and immunological observations on the diseases of this class have been extended, it has been more and more convincingly demonstrated that even when the diseases themselves are of limited occurrence, as is true for instance of diphtheria, scarlet fever, and cerebrospinal meningitis, infection with the specific microörganisms which cause them is almost universal. It may, in fact, be accepted as a general principle that it is impracticable, in populous communities, so to isolate an individual from his neighbors as to insulate him continuously against exposure to infections transmitted directly in this way from other people. Such relative isolation as the most favored classes of society enjoy may serve to postpone the average age at which first infections occur; it does not nearly suffice to afford complete and continuous protection over such a period as 20, 30, or 40 years.

Therefore, for protection against diseases of this class, we have ceased to rely greatly upon simple avoidance of exposure and have turned to other measures, such as specific immunization and treatment and, in certain diseases such as measles and whooping cough, the device of postponing exposure from infancy until later childhood, when infection is less dangerous.

It has, moreover, become recognized that protection against exposure to highly prevalent, endemic infections, unless it can be kept up through life, may in the end prove more harmful than beneficial. For the same con-

1. It is generally conceded that the control of human infection from bovine sources has already been highly effective in this country and that further control is practicable. All that follows refers to infection from *human* sources.

2. This and preceding paragraphs should not be interpreted as implying that the isolation of known cases of the diseases of this group is useless. There is reason to believe that infections contracted from carriers at large in the general population may be less dangerous than those contracted in the immediate environment of clinical cases.

cealed infections which spread disease producing bacteria and viruses so widely through the population serve at the same time to build up a protective immunity. And since a good many infectious diseases are apt to be more severe in adults than in children between 5 and 15 years of age, the postponement of first infections from childhood to adult age may be actually disadvantageous.[2]

Finally, it is highly probable that the cyclic changes in prevalence which are observed in some diseases are brought about chiefly by evolutionary changes in the characteristics of the specific microörganisms, the causes of which are to be found in uncontrolled natural forces. Thus, within the last 100 years we have seen both diphtheria and scarlet fever, which previously were of widespread occurrence but relatively low prevalence, rather suddenly take on a much more malignant character and attain a much higher prevalence more or less throughout the world. Then, after some decades of high prevalence and malignancy, they have in the last 40 years gradually declined both in prevalence and severity. With respect to these and a number of other epidemic diseases, such as influenza, cerebrospinal meningitis and poliomyelitis, the explanation of such cyclic changes in severity and prevalence remains obscure, but we are obliged to recognize at least the possibility that they may be due to the operation of natural forces beyond human control.

When these epidemiological conceptions, which are firmly enough established with respect to various of the acute epidemic diseases, are applied in interpreting the epidemiology of tuberculosis, they tend obviously to cast doubt upon the efficacy of the measures which have been taken to control tuberculosis by limiting exposure to the tubercle bacillus and upon the possibility of establishing permanent and complete control on this principle. However, the extremely pessimistic view of tuberculosis control which has been taken by many eminent students of the subject overlooks some important considerations which bear upon the question.

One of these considerations is the probability that infection established by a small number of microörganisms may be less severe in its course than infection resulting from a larger or frequently repeated dosage.[3] As regards human infection with the tubercle bacillus, the epidemiological evidence to this effect is fairly impressive and is supported by a good deal of evidence from experiments on lower animals. It may well be, therefore, that the measures which have been taken to limit the spread of the tubercle bacillus in our environment, even though they are insufficient to prevent eventual infection of nearly everybody, may still be of great effect in mitigating the *severity* of resulting infections, because of reduced frequency and dosage of infection. If this is so, it is a consideration of real importance.

It is also to be remembered that the frequency of exposure to the tubercle bacillus may have been reduced much more than would appear to be indicated by the results of tuberculin tests. For instance, if we find that at 15 years of age 60 per cent of the population show a positive tuberculin reaction, which we may take as evidence of prior infection with the tubercle bacillus, it is obvious that, under the worst conditions which can have existed in the past, the proportion infected before reaching this age could not have been greater than 100 per cent. It may therefore appear that there can have been no more than a

3. See reference 2.

40 per cent reduction in the prevalence of infection, whereas we know that there has been a much greater reduction in mortality. However, assuming a random distribution of exposure, the rate which would result in infecting approximately 99 per cent within 15 years is some 4 times the rate which would infect only 60 per cent within that period.[4] Therefore, the simple fact that under present conditions nearly everybody who reaches middle age shows evidence of having been infected with the tubercle bacillus does not at all imply that there has been no great reduction in the rate of exposure to infection.

A still more important consideration which has been too frequently overlooked when tuberculosis is compared with other communicable diseases transmitted directly from person to person by way of the respiratory tract, is that the tubercle bacillus is differentiated from other disease producing organisms of this group by the conditions governing its growth within the body and its escape from the infected host. When the tubercle bacillus invades the body it does not multiply upon the surface or in the superficial layers of the mucous membrane. It penetrates to the deeper tissues and, as it multiplies, is surrounded by a protective cell-wall which the body throws around it. In order to escape into the outside world and infect others it must break through this defensive wall. In pulmonary tuberculosis—the type of most consequence in the spread of infection—this result is relatively infrequent. In the great majority of infections the bacillus is walled off within the body, and the lesion eventually heals without breaking through to the external air passages. Thus, the conditions which limit the propagation of the tubercle bacillus are: (1) that in order to escape from its host it must cause a lesion which breaks through to the surface—in general an extensive lesion which severely damages the host—and (2) that it succeeds in producing such lesions in only a limited proportion of infected persons.

Various other pathogens of man are subject to one or the other of these conditions, but not to both. For instance, the virus of measles appears to be spread only from persons actually suffering from or in process of developing the eruptive disease; but the virus is so highly infective and pathogenic that it succeeds in producing this effect in nearly all persons who survive to adult age. On the other hand, the diphtheria bacillus, the pneumococcus, the virus of poliomyelitis, and various other pathogens transmitted by way of the respiratory tract, cause clinical disease in only a small proportion of those who are infected; but actual disease is not essential to propagation of these microörganisms, since sub-clinical or "carrier" infections, being equally "open," suffice to spread them from host to host, and to perpetuate the species.

The combination of these *two* limiting conditions is the peculiarity of the tubercle bacillus which makes it more amenable to control by case-isolation than are diseases such as diphtheria, scarlet fever, and measles. For notwithstanding that the tubercle bacillus infects nearly everybody sooner or later, most of the infections are "sterile," in the sense that although the bacilli multiply within the body they do not escape to reach other hosts. Only the relatively small proportion of infections which progress to the stage of open lesion are successful

4. The conditions assumed in making these calculations are of course entirely hypothetical, and much simpler than obtain in nature. The figures given are to be interpreted only as illustrating the principle that exposure rates may differ much more widely than would be indicated by casual comparison of the results of tuberculin tests.

in spreading the infection to others,[5] and it is only these sputum-positive cases that need to be isolated in order to prevent the spread of infection.

If the effective control of tuberculosis required *complete* isolation of *all* open cases, throughout the whole of their open stage, the present status could not be considered encouraging, for a large proportion of such cases are discovered only after they have reached a fairly advanced stage; and the isolation even of cases known to the health authorities is probably less than 50 per cent complete.

However, for the eventual eradication of tuberculosis it is not necessary that transmission be *immediately* and *completely* prevented. It is necessary only that the rate of transmission be held permanently below the level at which a given number of infection spreading (*i.e.*, open) cases succeed in establishing an equivalent number to carry on the succession. If, in successive periods of time, the number of infectious hosts is continuously reduced, the end-result of this diminishing ratio, if continued long enough, must be extermination of the tubercle bacillus.

Bearing in mind this principle, it is a fair inference that in this country as a whole we have already reached the stage at which the biological balance is against the survival of the tubercle bacillus, for year by year the mortality from tuberculosis is decreasing. It is true that we do not have equally direct statistical evidence of a proportionate decrease in the prevalence of infective cases, taking into account not only the number of cases but duration of the open stage; but there appears to be no good reason to doubt that the prevalence of open cases is diminishing at something like the same rate as mortality from phthisis. This means that under present conditions of human resistance and environment the tubercle bacillus is losing ground, and that the eventual eradication of tuberculosis requires only that the present balance against it be maintained.

As to maintenance of this balance—favorable to us, unfavorable to the tubercle bacillus—there are, of course, elements of uncertainty, among them uncertainty as to the stability of our civilization. But if it be assumed that environmental control affecting the spread of tubercle bacilli from existing foci can be maintained at its present level (and we may justly expect to improve it), we know of only two forces which, singly or together, would check or reverse the downward trend of tuberculosis. These are: (1) a decrease in human resistance to the disease, or (2) some fundamental change in the adaptation of the tubercle bacillus to its host, tending to favor survival of the parasite.

With respect to the latter possibility, we can do no better than base future expectations on past experience. Upon this basis, if we were discussing diphtheria, scarlet fever, or influenza, their past history would lead us to expect future changes, more or less sudden, in the disease-producing properties of their causative organisms. But present knowledge of tuberculosis is consistent with the view that the specific properties of the tubercle bacillus have not changed appreciably in modern times; and in the absence of compelling evidence for such variation in the past, we are under no necessity of anticipating it in the future. Therefore, while we have no means of excluding this possibility, I do not know of any reason why we should expect it.

A question of more immediate concern is whether, with progressively diminished exposure to tuberculous in-

5. It is quite possible that tubercle bacilli may escape from apparently "closed" lesions more frequently than is implied here; but epidemiological evidence indicates that demonstrably open pulmonary lesions are of predominant importance in the spread of infection.

fection, we must expect such decrease in human resistance to this infection as would check or reverse the present downward trend.

It is probable that one of the most important factors in the decline of tuberculosis has been progressively increasing human resistance, due to the influence of selective mortality and to environmental improvements such as better nutrition and relief from physical stress, tending to raise what may be called nonspecific resistance. It is, however, a reasonable expectation that the increase in average resistance due to these causes will be maintained, for, while complete elimination of the mortality from tuberculosis would check this process of raising genetic resistance, there is no apparent reason why it should result in reversion to a state of higher average susceptibility than exists today. Also, any gains due to better nutrition and to other elements of personal hygiene should be permanent if civilization continues at its present level or a higher one.

The kind of resistance which is of a less permanent order and which seems more likely to be lost, is individual specific immunization by so-called latent infection. At present a majority of the population in many areas acquire their first infection with the tubercle bacillus between late infancy and adolescence, precisely at the age when the immediate reaction to infection is most favorable. However, further reduction in the prevalence of tubercle bacilli in the environment must necessarily postpone first infections to a later average age; and, as it is believed by some authorities that primary infection is more dangerous in adults than in children, it is feared that such postponement of infection will in the end prove disadvantageous.

The question which is thus raised cannot at present be answered with assurance. We do not yet know enough about the nature and durability of any immunity which may be conferred by infection acquired in childhood. It is, however, significant that in those areas where childhood infection is most common, we find the highest mortality in adult life; and that in areas such as Cattaraugus County, N. Y., where a majority of adolescents are demonstrably tuberculin negative, the mortality in adult life is low. Also, occupational statistics show that in adult life the mortality from tuberculosis is lowest in the professional group who, as a class, have been least exposed to infection in childhood. Therefore, while this whole question obviously needs much more study, there is at present no compelling evidence that the downward course of tuberculosis must be checked by eventual loss of mass immunity.

We need not assume, then, that tuberculosis is permanently and ineradicably engrafted upon our civilization. On the contrary, the evidence indicates that in this country the balance is already against the survival of the tubercle bacillus; and we may reasonably expect that the disease will eventually be eradicated. There can be no certainty of this result, but it is an expectation sufficiently well grounded to justify shaping our tuberculosis control program toward this definite end.

As regards means to this end, an effective program of tuberculosis control must first of all be definite and specific, aiming at the prevention of tuberculosis by the most direct methods possible. At the same time it cannot be too greatly narrowed; it must not only provide for the discovery and medical care of tuberculosis and isolation of open cases, but must equally include a generous plan of social assistance. It is impossible, within a brief space, to discuss the details of such a program, extending as it must in many directions. The most that can be done is to summarize the principal

kinds of activity and to set them in an order of relative importance. This I think should be about as follows:

1. The isolation in sanatoria of *all known* open cases of pulmonary tuberculosis, continuing isolation so long as the cases remain open.
2. Adequate medical care, preferably in institutions, for the *known* cases of tuberculosis which are active but not in an open stage, since these cases constitute the group most likely in the immediate future to become infectious.
3. More vigorous effort to find cases of tuberculosis earlier and to bring them more promptly under medical care and under isolation if they are discharging bacilli
4. Special protection, including medical observation and advice, and financial aid as needed, for those groups who, though not at the time suffering from tuberculosis, are most imminently endangered.

The isolation of *known open* cases is placed first because it is the most direct method that we have for reducing the prevalence of tubercle bacilli in our environment; the measure which, applied to the smallest number of people, gives the maximum of protection to the community. It is also one of the measures at present often neglected or compromised by makeshift attempts at home isolation. But the broader reason for giving first place to the isolation of open cases is that if this is carried out thoroughly it leads up to all the other measures indicated. For it is in the household associates of the open case that the search for additional cases should begin, with the certainty of finding some that are in need of medical care; and, if prevention of tuberculosis is the aim, nowhere is generous financial aid more urgently needed or better justified than in the families of the tuberculous poor who bear the double risk of intimate exposure to the tubercle bacillus and poverty.

Thus the known open case is the logical center from which to develop protective measures of all kinds. And merely to carry out *thoroughly* this one item in the program, the institutional isolation of all known open cases, is no simple matter. It involves much more than diagnosing the cases and providing beds for them at public cost. It equally involves inducing the patients not only to enter the institutions, but to remain there as long as may be necessary, and making it possible for them to do so. The medical and social organization which best meets all these needs in all discovered cases of open tuberculosis will, I think, be the organization best prepared to spread its activities more widely from this center.

How far the tuberculosis control program should extend in the direction of general social betterment is a question which, perhaps, need not be answered. Probably nothing has been more influential in bringing about the decline of tuberculosis than progressive improvement in the social order as a whole; and nothing, perhaps, is more essential to the further effective control of the disease than to hold up, and so far as possible to improve, the standards of living of the lower economic strata. Obviously, the tuberculosis control program cannot expand to include the whole scheme of social betterment; but it can, and I think it should be concerned with raising the standards of living of those groups who are in most imminent danger of tuberculosis, beginning with the families of the tuberculous, and extending thence as far as practicable.

As regards the families of persons suffering with open tuberculosis, I think a clear distinction should be made between the kind of public aid given them and that which is given generally to the poor who are disabled. For if we are to require the isolation of open tuberculosis as a matter of public protection, it becomes a public responsibility to bear not only the cost of medical care, but the whole cost to the

patient's family, or as large a share as may be required. Moreover, it should be recognized that what is needed is not bare maintenance on a minimum or average " relief " standard, that it is not sufficient merely to prevent their dropping lower in the economic scale; it may often be necessary to raise them to a higher level. The two conditions which most favor tuberculosis are intimate exposure and poverty. Where these two meet is where double protection is needed, and it implies more than free medical care and hospital beds.

As the prevalence of tuberculosis is progressively diminished, the control program must necessarily be readjusted, at least in a quantitative way, and I think it should also be changed somewhat in direction. The soundest principle to follow seems to me to be that as the cases become fewer and fewer, preventive measures should be centered more and more upon the open cases; that the protection thrown around these infective cases and their immediate contacts be not relaxed, but steadily and progressively increased. This is a sound principle of epidemiology, for it is to be expected that as the prevalence of the tubercle bacillus in the general environment is diminished, infection and disease will become more distinctly focalized. In fact, there is already evidence of increasingly wide differentiation between the most sheltered and the most exposed groups of our population; and even now we should take more cognizance of this in directing our efforts.

The principle of centering effort increasingly upon the open cases themselves is also sound psychology. As the menace of tuberculosis becomes less imminent, the public will naturally take less interest in general and diffuse measures of protection. But in proportion as the disease becomes rarer, less a matter of everyday experience, we may be assured that public opinion will not only support but will even demand more rigid isolation.

Living Conditions

IT is often overlooked, parenthetically, that in writing of disease physicians did not limit themselves to its clinical aspects. They were necessarily concerned with ultimate as well as immediate causes, with the predisposing social environment as well as with the actual infections. There is much valuable information on general living conditions among the poorer classes in this country, whether they were Negro slaves or Irish laborers, in the papers and reports of socially-minded medical men. The same is true for other nations. If your library happens to contain the English poor law board report of 1842, for instance, it possesses one of the most systematic accounts in existence of the living conditions in British cities in early Victorian days. This was essentially a medical survey.

In like manner the whole early literature on hygiene, both personal and public, possesses social meaning. Much of it found its way in the old days into the general libraries. When Sir John Sinclair prepared his bibliography of this subject about 1800, he was able to list nearly 1,900 items in European languages, which suggests that it was even then no small literature.—Richard H. Shryock. *Library Collections in Social Medicine,* Am. Library Assoc., 1936.

Recent Advances in Our Knowledge of the Problems of Air Conditioning*

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FROM the ameba to man, from the bacterium to the oak tree, the vital processes of all living things depend upon 5 essential factors: food (including regulative mineral salts and vitamins), oxygen, water, temperature and light.[1] Animals do not derive their food directly from the atmosphere but they do depend indirectly upon atmospheric nitrogen and upon the energy of the light rays which pass through the atmosphere as transformed into potential energy by the green plants. The other 4 factors as they influence the life of man are immediately related to the atmospheric ocean in which we live.

In addition to these positive essentials for existence, life depends on freedom from certain harmful conditions—mechanical injury, the presence of toxic chemical substances, and the attacks of inimical living things, predatory or parasitic. In all these 3 respects the atmosphere about us may play a part as the carrier of injurious dust particles, noxious gases and, under certain conditions, of the microbe of disease.

The relations of the atmosphere to human health and comfort are, therefore, manifold and important; and it may not be out of place to review briefly the progress which has been made during the past few years in our knowledge of this field of physiological science.

We may conveniently begin with the harmful foreign substances which may be carried by the atmosphere and, first of all, with injurious dust particles. This factor is of primary importance in various industrial processes. Every year brings new evidence of the gravity of the problem of silicosis. I am personally inclined to believe that the total influence of this disease and of the tuberculosis associated with it upon the mortality of the working population of the United States may be more serious than that of industrial accidents. It is certainly of vastly greater significance than the industrial poisonings. The control of this hazard, by the use of non-siliceous materials, by the introduction of wet processes or enclosed processes, by local exhaust ventilation and by the employment of adequate masks and respirators is one of the basic problems of air hygiene. In other industries, the presence of non-siliceous but irritating dusts is associated with high prevalence of pneumonia and bronchitis and other acute respiratory disorders. The dust problem has been solved in the Rand mines of South Africa (where no miner en-

* Read before the Industrial Hygiene Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 23, 1936.

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tering the industry since 1923 has contracted silicosis) and elsewhere, so that it is general administrative application rather than the availablity of effective preventive methods which is at fault.

Outside of industry, we have little exact information as to the effects of atmospheric dusts upon health. In cities where there is much dust and soot, there may be hygienic advantages and there are certainly esthetic advantages in the removal of the suspended solids carried in the street air before its admission to occupied spaces. This may be accomplished by the use of air washers, by impingement on viscous coated surfaces or by filtration through dry screens and the amount of dirt collected by such devices is at least visually impressive. One special application of such devices for the removal of pollen is of considerable importance for sufferers from hay fever,[2] and good devices are available for a single room as well as for central ventilating plants.

The next type of foreign impurity which must be considered in connection with the atmosphere is that which involves the presence of living microörganisms, particularly those of pathogenic nature. When Chapin, a quarter of a century ago, demonstrated the superior importance of disease transmission by food, fomites, and contact, as contrasted with air and dust this problem was relegated to a position of insignificance. The recent work of W. F. Wells at Harvard has, however, reopened the whole question. Wells first of all devised a new instrument for the enumeration of bacteria in air which appears to be distinctly superior to any earlier device used for this purpose.[3] Second, he demonstrated the important fact that while droplets of a certain size (over 0.1–0.2 mm. in diameter) settle rapidly to the floor, those below this critical value lose their water by evaporation before they fall for any considerable distance,[4] and showed that bacteria suspended in fine droplets would actually persist in considerable numbers in the atmosphere for many hours.[5] These results certainly indicate the possibility of airborne infection, and Wells has recently been working on the sterilization of the air of hospitals or sick rooms by ultraviolet radiation.[6]

This work of Wells deserves very serious consideration. There is always, however, a gap between the possibility of a given mode of infection and its practical importance. To the writer, the results of actual experience with the treatment of various communicable diseases in open wards weighs heavily against the idea that aerial transmission has great quantitative importance, so far as bacterial infections are concerned. Such experience shows that diphtheria and scarlet fever can be nursed in an open ward without cross-infections, while with chicken pox and measles in their early stages cross-infections occur in spite of all precautions.[7] The recent extension of Wells's work to the virus infections [8] should be of substantial practical importance in connection with the operation of isolation hospitals for the virus diseases, but there seems to the writer, in the light of clinical and epidemiological experience, to be no basis whatever for a general program of atmospheric disinfection in living and work places.

From this consideration of the nonliving and living suspended particles present in the atmosphere, we may turn next to the problem of its chemical composition. In the 18th century, the bad effects of vitiated air were attributed to lack of oxygen, but Lavoisier in 1777 showed that the changes in oxygen content in the worst ventilated rooms are below the threshold of physiological significance. The toxic influence of carbon dioxide was then assumed to play a major rôle, but this

view too was exploded by Pettenkofer in 1862. For practical purposes variations in oxygen and carbon dioxide content of the atmosphere seem relatively unimportant at ordinary atmospheric pressures on the earth's surface. In deep parts of mines or at high altitudes oxygen deficiency is, of course, of major significance.

In various industrial establishments and wherever automobile engines, gas heaters, or other heat sources operate under conditions of imperfect combustion, carbon monoxide is a serious menace; and in industry benzol and many other toxic fumes and gases may present grave problems.

So far as the air of an ordinary occupied space is concerned there remains one other factor to be considered —that of the unidentified substances associated with the odors produced by human bodies and by various organic substances. Pettenkofer attributed the major influence of a vitiated atmosphere to hypothetical "morbific matter" given off in the breath; but all recent work has negatived the existence of definitely toxic materials of this kind. There is, however, reasonably clear evidence of an influence of such odors upon appetite which is of real hygienic significance. This was demonstrated by the New York State Commission on Ventilation with respect to body odors; while Greenburg and the writer reported that the growth rate of guinea pigs was retarded by fecal odors. Recently, Herrington and the writer have shown in a more carefully controlled study that relatively slight odors of heated house dust (even when not consciously perceived by the subjects) had a very definite effect in reducing the appetite for food,[9] an influence of distinct hygienic significance.

The old standard calling for an air change of 30 cu. ft. per minute per occupant (which still persists in many of our state laws and regulations governing school ventilation) was based on the Pettenkofer concept of "morbific matter" given off in the breath and bearing a direct relation to the elimination of carbon dioxide. The recognition that no such specifically toxic substances exist and that such odors as are present vary widely with many factors makes such a rigid universal requirement clearly unjustifiable; and the Committee on Ventilation Standards of the American Society of Heating and Ventilating Engineers 4 years ago wisely adopted the following more reasonable formula[10]:

> The quantity of air used to ventilate the given space during occupancy shall always be sufficient to maintain the standards of air temperature, air quality, air motion, and air distribution as herein required. Not less than 10 cu. ft. per minute of the total air circulated to meet these requirements shall be taken from an outdoor source.

It is, however, important that air change should be sufficient to avoid the presence of body or other odors such as have been shown to influence appetite. C. P. Yaglou at Harvard has made valuable contributions in regard to this problem and has shown that body odor, as might be expected, may vary widely with the cleanliness of the occupants, that it bears no close relation to carbon dioxide elimination and that it is impossible to fix any single standard of necessary air change applicable under all conditions. The volume of fresh air necessary to avoid odors may vary from 7 cu. ft. per minute (with adults in a room having 500 cu. ft. of air space per person) to 38 cu. ft. with grade school children of uncleanly habits in a room having 200 cu. ft. of air space per child.[11]

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tering the industry since 1923 has contracted silicosis) and elsewhere, so that it is general administrative application rather than the availablity of effective preventive methods which is at fault.

Outside of industry, we have little exact information as to the effects of atmospheric dusts upon health. In cities where there is much dust and soot, there may be hygienic advantages and there are certainly esthetic advantages in the removal of the suspended solids carried in the street air before its admission to occupied spaces. This may be accomplished by the use of air washers, by impingement on viscous coated surfaces or by filtration through dry screens and the amount of dirt collected by such devices is at least visually impressive. One special application of such devices for the removal of pollen is of considerable importance for sufferers from hay fever,[2] and good devices are available for a single room as well as for central ventilating plants.

The next type of foreign impurity which must be considered in connection with the atmosphere is that which involves the presence of living microörganisms, particularly those of pathogenic nature. When Chapin, a quarter of a century ago, demonstrated the superior importance of disease transmission by food, fomites, and contact, as contrasted with air and dust this problem was relegated to a position of insignificance. The recent work of W. F. Wells at Harvard has, however, reopened the whole question. Wells first of all devised a new instrument for the enumeration of bacteria in air which appears to be distinctly superior to any earlier device used for this purpose.[3] Second, he demonstrated the important fact that while droplets of a certain size (over 0.1–0.2 mm. in diameter) settle rapidly to the floor, those below this critical value lose their water by evaporation before they fall for any considerable distance,[4] and showed that bacteria suspended in fine droplets would actually persist in considerable numbers in the atmosphere for many hours.[5] These results certainly indicate the possibility of airborne infection, and Wells has recently been working on the sterilization of the air of hospitals or sick rooms by ultraviolet radiation.[6]

This work of Wells deserves very serious consideration. There is always, however, a gap between the possibility of a given mode of infection and its practical importance. To the writer, the results of actual experience with the treatment of various communicable diseases in open wards weighs heavily against the idea that aerial transmission has great quantitative importance, so far as bacterial infections are concerned. Such experience shows that diphtheria and scarlet fever can be nursed in an open ward without cross-infections, while with chicken pox and measles in their early stages cross-infections occur in spite of all precautions.[7] The recent extension of Wells's work to the virus infections [8] should be of substantial practical importance in connection with the operation of isolation hospitals for the virus diseases, but there seems to the writer, in the light of clinical and epidemiological experience, to be no basis whatever for a general program of atmospheric disinfection in living and work places.

From this consideration of the nonliving and living suspended particles present in the atmosphere, we may turn next to the problem of its chemical composition. In the 18th century, the bad effects of vitiated air were attributed to lack of oxygen, but Lavoisier in 1777 showed that the changes in oxygen content in the worst ventilated rooms are below the threshold of physiological significance. The toxic influence of carbon dioxide was then assumed to play a major rôle, but this

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and where effective openings in windows and skylights equal 5 per cent of the floor area.[12]

We may pass next from the problems which arise from the presence of specific impurities (dust, bacteria, and objectionable chemical substances) in the air to the general physical characteristics of the atmosphere itself and their physiological effects upon the human body. These effects are, of course, chiefly related to the elimination of the heat liberated in the vital process; but before proceeding to a consideration of this major problem we must allude briefly to alleged electrical and electromagnetic effects which have been considered as important by certain European investigators.

The claims of F. Dessauer at Frankfort that positively charged ions in the atmosphere tend to increase respiratory rate, basal metabolism, and blood pressure, and to produce headache and malaise, while negative ions decrease the physiological activities mentioned, cause a sense of exhilaration, and cure various pathological conditions associated with hypertension[13] have aroused wide interest. In Russia an Institute of Ionification directed by Tjichevsky has made even more extravagant claims along similar lines. Yaglou, however, has obtained essentially negative results with regard to the influence of small ions of varying charge.[14] The John B. Pierce Laboratory of Hygiene has conducted extensive researches on large ions (produced by the Dessauer apparatus) and has obtained negative results in experiments with human subjects, while experiments on animals with small ions were also without significant results.[15] Since these studies involved the use of millions of ions per c.c., all of one sign, while the atmosphere contains only some thousands of ions with positive and negative ions nearly equal in number, it seems certain that the influence of ionic charge as a practical problem of ventilation can be dismissed from further consideration.

The interesting fact brought out by Herrington and the writer[16] that a sense of subjective unpleasantness is associated with a high ion content in the outdoor atmosphere has no bearing on this question, since the relationship is manifest with both negative and positive ions irrespective of sign. The authors explain the phenomenon as probably due to the effect not of ionic charge as such but of the gaseous products of combustion which make up a large proportion of the ions in city air. If this view is correct, we have here new evidence of the subtle effects of minor atmospheric impurities upon psychological reactions.

In our introductory analysis of the environmental essentials for the life process, sunlight was listed as one of the 5 fundamental factors; and it was pointed out that the condition of the atmosphere is directly related to this factor in so far as atmospheric impurities limit the transmission of light rays. Sunlight is important from the standpoint of adequate illumination, as an aid to cleanliness, as a psychological stimulant, and, above all, from the effect of ultra-violet rays on the synthesis in the body of the anti-rachitic vitamin. We have here, then, a sound hygienic basis for the campaign against the smoke nuisance.

The possible physiological effects of electro-magnetic vibrations of specific wave lengths is a fascinating subject for speculation, and Leonard Hill has recently made surprising claims in regard to the influence of certain wave lengths upon the nasal mucous membranes. He claims that the rays from a dull red or dark source of heat excite a congestion of the nasal mucous membranes which markedly narrows the airways of the nose in sensitive subjects (nose-closing effect). On the other

hand the effect of such long infra-red rays is supposed to be specifically neutralized by red or short infra-red rays lying between 25,000 and 30,000 Angström units (nose-opening effect). The work of Dufton and Bedford in England [17] and of Greenburg, Herrington, and Winslow in this country [18] has entirely failed to confirm the existence of "nose-opening" rays and has led to the conclusion that the "nose-closing" effect (which is a real one) is not related to electro-magnetic wave lengths but merely to heat, and can be reproduced quite as well by immersing the arm in hot water.

Aside, then, from the presence of harmful industrial dusts and of toxic fumes produced by industrial processes, or incomplete combustion, from the possible danger of aerial transmission of air-borne infections of the virus type, and from the psychological effects of body and other odors, the major effects of the atmosphere upon human health and comfort are related to its influence upon the loss of heat from the body. Except in the factory and perhaps in the hospital ward, this is the major outstanding problem of air hygiene.

The problem is by no means, however, a simple one. Heat losses from the human body are governed by at least 4 different environmental factors: air temperature, air movement, relative humidity, and the sum of the radiation effects of surrounding surfaces. Houghten, Yaglou, and their associates in the A.S.H.V.E. Research Laboratory at Pittsburgh began in 1923 a most important series of studies on the relative effect of the first 3 of these factors which have led to the highly significant concept of "effective temperature," an arbitrary index of the subjective reaction of the human body to a given combination of air temperature, air movement, and humidity. The effective temperature for any given set of air conditions is the temperatures of saturated air having a velocity or turbulence of 15–25 ft. per minute which would produce a sensation of warmth or cold equivalent to the actual combination of air temperature, air movement, and humidity described. On the basis of this index, the Pittsburgh investigators have prepared charts indicating comfort zones for winter and summer which have proved of the greatest value in the promotion of sound progress in the field of air conditioning.[19]

The Pittsburgh studies, however, almost completely ignored one environmental factor governing heat loss from the body—the influence of the radiating surfaces which surround it. Pettenkofer, 60 years ago, realized the importance of this factor but it was later forgotten and practically ignored until 15 years ago. Recently the significance of radiation effects has been recognized once more and a whole series of new instruments have been devised for measuring the influence of radiant heat, among which are the Globe Thermometer of Vernon,[20] the Eupatheoscope of Dufton,[21] and the Thermo-Integrator of Winslow and Greenburg.[22]

It is obvious that a rational analysis of the thermal equilibrium of the human body requires due consideration of all the 4 environmental factors of air temperature, air movement, humidity, and radiation as they influence loss of heat by evaporation and loss or gain of heat by convection and radiation. If the body were a simple physical mechanism like a eupatheoscope or thermo-integrator with an evaporating jacket, a consideration of the net influence of the 4 environmental factors would give a complete answer to the problem. The body is, however, by no means such a simple physical instrument. By constriction or dilation of the cutaneous blood vessels, by the secretion of sweat, and by increase or

decrease of metabolism, it alters its own thermal properties in response to a changing environment. It is reasonably clear that the sensations which one feels on a mountain top or on a sea beach with cool moving air and high radiation are distinctly different from those experienced in a room where the air is warm and still and radiant surfaces relatively cool even if the net balance of heat interchange be the same.

It is this problem of the physiological reactions of the human body effected by different avenues of heat interchange which now requires intensive study. At the John B. Pierce Laboratory of Hygiene we are devoting ourselves primarily to this problem. We have devised a new method of partitional calorimetry [23] for this purpose which is already yielding significant results. Our experiments are conducted in a copper booth whose surfaces reflect radiant heat without becoming warmed themselves so that a wide variation between air and wall temperature can be maintained. The subject is seated on a delicate scale which records evaporative loss and, by formulae we have deduced, it is possible to measure with a high degree of accuracy the heat losses due to convection and radiation by differences between mean skin temperature and air temperature and equivalent radiation temperature, respectively. Records of metabolism make possible a complete partition of heat interchanges over short periods of time; and the results already attained are revealing important differences in physiological response to the 4 specific environmental factors governing heat loss. Basic studies of this sort are, as we believe, essential to a comprehension of the physiological reactions upon which intelligent air-conditioning must depend.

We may now pass to a brief consideration of certain important tendencies in the practical art of air conditioning.

The first of these trends which seem of special significance is an increased emphasis on the insulation of occupied spaces, with respect to heat interchange by both radiation and convection. During the heating season it is, of course, obvious that the amount of heat artificially introduced will be materially influenced by the extent to which building construction limits heat loss. Thus, while a 1 inch thickness of concrete may transmit 12 B.t.u. per hr. per sq. ft. per Fahrenheit degree difference in temperature, the corresponding value for felt or glass wool insulation may be about one-quarter of a B.t.u. or one-fiftieth as much.[24] The development of new synthetic building materials may be of material aid in the simplification of this problem.

The introduction of one or more layers of aluminum foil or some other material which reflects radiant heat is of great value in increasing insulation, particularly when applied to the ceiling; and recent studies in England (founded on the pioneer work of Leslie in 1804) have stressed this factor, both for keeping heat in during the heating season and for protection against the sun's rays in the tropics.[25]

Aside from heat transmission through walls and ceilings, there are important heat losses by transmission through window glass and by actual infiltration of air through cracks and building materials themselves. These two factors combined may often equal or exceed the total loss by transmission through building materials. Double windows and the employment of weather-stripping materially reduce such heat losses.

In the field of heating and ventilation itself, there have been many technical improvements, particularly in the development of new devices for unit ventilation in an individual room.

The most interesting trend here is, however, the introduction of practical systems of radiant heating in England under the leadership of A. H. Barker. An ordinary exposed "radiator" actually emits less than half its heat by radiation. In the English radiant heating, hot water pipes are embedded in walls or ceiling so as to produce a surface temperature of about 100° F. or special heating panels are affixed to the walls and heated to a somewhat higher temperature by superheated water or by steam or electricity.[26] The use of radiant heating has two obvious advantages. It avoids the unsightliness and the utilization of space for heating appliances within the room and, since the radiant heat emitted is very gradually transformed into convected heat by the warming of other surfaces, marked convection currents are avoided and a very even temperature produced throughout the room. Opinions differ as to the cost of the process even in England, and its applicability to cold climates is still questionable. In combination with good insulation of buildings it may, however, have a real field of usefulness in this country. From a physiological standpoint there are indications that a cooler atmosphere combined with warmer walls may have distinct advantages.

The heating and ventilating engineer has a wide choice of procedures for air conditioning, ranging from heating by a stove and ventilating by a window at one extreme, to control of air quantity and air movement, temperature, humidity, and dust content by a central plenum system on the other. It is important to recognize that heating and ventilation are in essence two distinct processes and two processes which are often antagonistic, since the air supply necessary for ventilation in winter requires additional heat to balance its cooling effect.

The first factor to be considered is that of ventilation—or dilution of impurities—since it is clear that a certain minimum air change is essential to avoid the psychological effect of odors even where toxic substances produced by imperfect combustion or industrial processes are not present. Where ample cubic space per person is available, as in the ordinary living room or office, infiltration and the use of windows will suffice to produce the necessary air change and no special provisions for ventilation are required. In the schoolroom and somewhat larger offices the use of window inlets and gravity exhaust ducts will often prove adequate. In larger offices and workrooms and in auditoria the supply of fresh air by mechanical means (by local or central plenum systems) will be found necessary.

If harmful dusts or fumes are present, special local exhausts must be provided to remove them; and if the outside air contains objectionable dusts (or pollen) removal of these foreign materials by air washers or filters may be desirable.

The factor of air movement is not an important variable in the heating season (except in workrooms where great heat is produced locally). If other requirements are met the air motion will be adequate. As to the control of relative humidity, there is some difference of opinion but on the whole it seems that this factor is not particularly important except where high temperatures occur. At normal temperatures relative humidity may vary over a wide range without important physiological effects and the A.S.H.V.E. Ventilation Standards permit a range between 30 and 60 per cent of saturation; and there is no convincing scientific evidence that a relative humidity below the minimum value stated is seriously objectionable.

With the problem of minimum air change and air purity settled, the next

problem is that of the supply of heat necessary to maintain a comfortable temperature. This requires a balance between the heat lost from an occupied space and the outside air and the heat produced by the occupants and by artificial heating and lighting sources. In rooms that are not crowded, heating is the predominant factor. In crowded rooms the heat eliminated from human bodies causes a rapid rise of temperature which must be balanced by a plenum supply of relatively cool air. Between lies a zone in which heating and ventilation operate in a delicate equilibrium.

If a plenum air supply (central or local) is necessary to meet the requirements for air change, the convected air is usually relied upon to control heating as well as ventilation, often, of course, combined with other heat sources within the room. Where plenum air supply is not required, we may heat from a central plant with local heat sources (convectors, radiators of the usual exposed type, or radiant panels); or by local heat sources such as stoves or radiant heaters.

In planning heating systems there are two important problems which require further study and whose solution may prove of far-reaching importance in future practice. These are concerned with the physiological and engineering values of the relative temperature of air, and walls, and of the relative temperature (convective or radiant) at different levels within the room. The latter point has been emphasized by Brabbée [27] and the latter has been raised by the English studies of radiant heating.

A wholly different set of problems is presented by the attempt to cool occupied spaces during the summer season. It is somewhat strange that this possibility should have been so long neglected. Man long ago realized that he could keep warm in winter; but accepted the summer heat as a dispensation of Divine Providence. Summer cooling has recently, however, attained recognition on a wide scale, particularly with regard to the cooling of theatres and more recently of railroad trains. The provision of cooled rooms for infants in hospitals is of particular importance on account of the sensitiveness of the vasomotor system in young children.

Like many new things this business of summer cooling has at first been overdone. I think there can be little doubt that many people have been injured by the sharp contrast between air-conditioned trains and the outside atmosphere. The *A.S.H.V.E. Guide* (1936, p. 73) suggests that with an outdoor temperature of 95° F. indoor temperature should not fall below 80°, while at 90° outdoors the differential should be 12° and at 80° outdoors only 5°. The A.S.H.V.E. has now a special Committee on Comfort Standards for Summer Cooling which is making valuable contributions to this subject.[28]

Cooling effects may be produced either by lowering the temperature of the air by the use of refrigerants or by evaporation of moisture, by lowering humidity without change of dry-bulb temperature or by increase of air movement. (See *A.S.H.V.E. Guide*, 1936, Chapter 10.) Another simple but quite effective device for the dwelling-house is the installation of an exhaust fan in the attic to draw in cool outdoor air during the night.[29]

From this analysis it is obvious that "air-conditioning" in the modern sense is something very much more complex than was connoted by the older term "ventilation." Ventilation has been defined as "the process of supplying or removing air by natural or mechanical means to or from any space"—a purely quantitative concep-

tion. The basic definition in the 1936 *A.S.H.V.E. Guide* is, however, stated as follows:

> Air conditioning has for its objective the supplying and maintaining, in a room or other enclosure, of an atmosphere having a composition, temperature, humidity, and motion which will produce desired effects upon the occupants of the room or upon materials stored or handled in it.

Of the vital importance of air-conditioning in this sense, we have the amplest evidence. The studies of Ellsworth Huntington [30] have demonstrated that outdoor climates which are too warm or too cold, too moist or too dry, have a very definite effect in increasing mortality rates, while C. A. Mills has recently shown that an overstimulating climate is related to an excess death rate from certain metabolic diseases.[31] Arnold and his associates [32] in experiments with animals have demonstrated the mechanism by which a warm atmosphere increases liability to intestinal diseases by diminishing the intestinal blood supply and lowering the acidity of the gastric juice. We do not yet know, on the other hand, how a cold atmosphere increases susceptibility to respiratory diseases but that it does so is clearly indicated by the excess rates for pneumonia among workers exposed to overheating and subsequent chill.[33]

The laboratory studies of the New York State Commission on Ventilation [34] and the extensive observations of Vernon in English factories [35] have shown how important the effect of overheating may be in diminishing productive efficiency.

In considering the problems of air-conditioning, as in other fields of public health, we should no longer, however, be satisfied with the avoidance of obviously harmful conditions. Health is a positive ideal—not merely the art of staying alive. Our aim should be efficiency and fulness and joy of living. We should not be content with air free from harmful dusts, fumes, and odors, and air which is warm enough to avoid chill and cool enough to avoid obvious discomfort and enervation. What we desire is atmospheric conditions which produce an active sense of physical well-being, a state of euphoria such as is experienced on the mountain top or the sea beach to which reference has been made above. We need much more fundamental studies of physiological reactions before this is possible; but I am convinced that we stand on the threshold of an era in air-conditioning in which the pleasure of positive physical satisfaction, and not merely the avoidance of dangers to health, will be our primary objective.

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Social Medicine

CONSIDERABLE material on social medicine has appeared, in recent years, in the better known journals of opinion; for example, in *Harper's Magazine*, *Scribner's*, and *The Survey*. These are of course readily available. The reports of special foundations are not always so accessible. The *Annual Report* for 1931 of the Twentieth Century Fund noted that there were then at least 22 American foundations directly interested in health problems. In addition to these large foundations, there are many private societies that carry on research or propaganda relative to health insurance (such as the American Association for Social Security) and many others dealing with such special matters as birth control, the control of special diseases, mental hygiene, health education, the care of the physically handicapped, infant and maternal welfare, and so on.—Richard H. Shryock. *Library Collections in Social Medicine*, Am. Library Assoc., 1936.

The Sylvatic Plague Committee*

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A. ADMINISTRATIVE ACTIVITIES

THE executive committee in consultation with Dr. Ira N. Gabrielson, Chief of the U. S. Biological Survey, Washington, C. Gill of the Federal Works Progress Administration, and Assistant Surgeon General C. E. Waller of the U. S. Public Health Service, has aided the members of the committee in the preparation of state projects for rodent control. The California project was submitted on March 1 by the Department of Agriculture (total estimated cost $84,490). The committee members have been informed relative to newer developments by 6 confidential circular letters and copies of the minutes covering the meetings of the executive committee. Antiplague serum in small amounts will be kept available at the George Williams Hooper Foundation, Medical Center, San Francisco, Calif.

B. SCIENTIFIC ACTIVITIES

The Sylvatic Plague Committee has continued to collect information concerning the extent of human and rodent plague on the American Continent. The observations on sylvatic plague in 1936 and the interpretations of the scientific facts may be summarized as follows:

A. HUMAN PLAGUE

Four non-fatal human cases of plague have been bacteriologically proven. There is strong indirect evidence that a 5th case was infected with the plague bacillus. Three, most likely 4, cases occurred in California and 1 in Utah. The histories of these cases are very interesting and deserve detailed comment.

California Case 1—Veterinarian, age 37, Santa Rosa, Sonoma County, noticed on April 3, 1936, malaise, fever 102° F. and pain in the left axilla. In the left axilla one firm node, 3 to 5 cm., was felt; the skin over the node was erythematous and of brawny induration; no lymphangitis. On April 9 the patient was hospitalized in San Francisco. He appeared extremely ill and prostrated. The node was punctured and a few drops of fluid were cultured. On April 12 the broth enrichment culture yielded typical *P. pestis* which were readily agglutinated by a specific antiplague serum. The blood culture taken on April 9 was positive for the same organism on the 4th day of incubation. On April 15 his temperature reached a normal level but a sharp rise due to an old arthritis occurred on April 19; within 5 days it subsided and the patient was discharged on the 27th day; recovery has been uneventful.

Since this case of *pestis minor* originated in a county in which neither murine nor sylvatic plague had been recognized, a searching investigation was instituted. It was learned that the veterinarian had on March 31, 2 days before the onset of his illness, treated an 8 months old cat with an

* Abbreviated from detailed Second Report presented before the Western Branch American Public Health Association at the Eighth Annual Meeting in Phoenix, Ariz., April 13, 1937.

abscessed jaw, brought to the hospital from a cabin in a forest region in which rodents are rarely observed. The cat died before a diagnosis could be made. Inquiries revealed that the cat had some contact with a skunk a few days before the swelling developed on the jaw about March 15. In the course of the survey, 476 rodents—rats, mice, and squirrels—*Citellus douglasii* (286 specimens) were examined but no gross plague infections were established. Suspicion was therefore centered on the cat and the knowledge concerning plague infection in this carnivore has been collected and is summarized.

The susceptibility of cats to plague was first established by the Austrian Plague Commission by feeding them with the bodies of animals dead with *P. pestis*. McCoy and Chapin, Toyama, and others have also reported the susceptibility of cats. Spontaneous infections (12 cases) have been observed and bacteriologically proven by Robertson at Cape Town (1901); the type was bubonic affecting the glands of the neck and submaxillary lymph-nodes. Similarly, Hunter in Hong-Kong saw cats, which were used in the hunting of infected rats, suffer from acute or chronic plague. However, important is the recent report by Pirie in South Africa (personal communication) who found among 11 cats 2 with plague bacilli in the spleen. Neither animal had obvious lesions of plague and it seems probable that cats may often die from a surfeit of plague-infected rodents (? from a toxemia) without becoming definitely infected. Other carnivores, such as the suricate and the yellow mongoose, are frequently found dead in the wake of a plague epizoötic but without actual infection.

Although the rôle of the cat as a possible link in the transmission chain of the *P. pestis* from rodents to man should always be kept in mind, it must be emphasized that the owner of the cat involved in the Sonoma case had very intimate contact with the pus removed from the abscess 2 days before he brought the animal to the veterinarian. He has remained well. The veterinarian remembers that he used his right hand in lancing and swabbing the abscess, while his bubo developed on the left side. The history of the only dog brought to the hospital and professional visits of the veterinarian were carefully investigated but the source of the plague infection in Sonoma County remains unexplained.

California Case 2—An 11 year old boy living in an isolated section of Monterey County, Calif., while cleaning a brush rabbit on June 13, cut his right thumb on a bone. No infection developed locally, but June 16 he complained of pain in the right axilla and was not feeling well. June 17 he had headache and considerable pain in the axilla and was taken to the hospital—temperature 104° F., pulse 96, respiration 22—prostrated and toxic, swelling in right axilla. On June 18 the temperature was 105.6°. Smear from bubo apparently showed bipolar organisms. Blood was inoculated into guinea pigs. June 19 the patient was much improved, temperature 103.8°. June 20 the maximum temperature was 103°; bubo was definitely palpable and tender. From this time on the patient showed gradual improvement, and June 23 the temperature was normal. June 25, guinea pig inoculated with blood taken June 18 died, and smears from organs showed many typical bipolar organisms.

Ground squirrels and brush rabbits are plentiful in the locality, but the patient denied shooting any ground squirrels recently, although his dog frequently brought them in. Ticks are plentiful, and he had been bitten by one 4 days before illness.

The examination of 1,378 rodents (*C. beecheyi* and rats) failed to reveal plague infected animals. In September *a pool of 259 fleas from 58 Citellus beecheyi* collected in an area north of the place in which the human infection occurred was *proved to be infected with P. pestis.*

California Case 3—A woman, age 50, living

in her summer cottage at Tahoe Vista, Lake Tahoe, Placer County, became ill July 23 with chills, high fever, nausea and vomiting, headache, and prostration. July 25 relapsing fever was suspected and 0.4 gm. neoarsphenamin administered. The blood smear proved negative and the patient was transferred to Reno July 27. A blood culture July 29 yielded a Gram-negative bacillus. August 1 small pustular lesions became evident on the outer surfaces of both lower extremities near the knee and hip joints. A few days later several large indurated areas were apparent on the left hip and the outer surface of the right leg just below the knee. On incision, several drams of thick purulent material was obtained. An organism indistinguishable from that isolated from the blood was cultivated. The patient was very ill and ran a fairly constant temperature around 103° F. for 1 week. With gradually subsiding temperature, normal was reached at the end of the second week and remained so until discharge on the 25th day after entrance. The 5 large abscesses drained for several weeks and healed uneventfully. The treatment was symptomatic; blood transfusions and intravenous sodium salicylate were given. The etiologic diagnosis was made by an identification of the two cultures —blood and abscess material—as *P. pestis* by the Hooper Foundation. Blood collected September 5, the 44th day of illness, agglutinated the plague bacillus in a dilution of 1:80.

As an isolated observation, this case offered diagnostic difficulties and without the cultures would doubtless have escaped etiologic identification. The absence of local or general lymphadenopathy failed to suggest bubonic plague. However, septicemic plague associated by petechiae and pustules with cellulo-cutaneous necroses in the gluteal region have been seen by many observers even in ancient times. This so-called carbuncular variety, as a rule, appears only at the middle and decline of an epidemic when the type of the disease is less fatal. It is generally believed that the mortality of this type is less than the bubonic form.

Inquiries disclosed the important fact that the woman buried a dead chipmunk about a week before the onset of her illness. She did not notice any type of insect bites and did not see any ticks. Although 999 rodents (*C. beecheyi, Sciurus, Callospermophilus, Eutamias, Glaucomys,* etc.) were examined, no plague infections were demonstrated. *Three batches of fleas collected from these rodents and tested on guinea pigs proved to contain P. pestis.* In October, Dr. C. R. Eskey proved the plague in a Tahoe chipmunk (*Eutamias quadrivittatus Frate*) trapped about 30 miles from the region in which the human case had occurred.

California Case 4—A 10 year old boy with a history of a squirrel bite without penetration became suddenly ill at a camp in the San Bernardino Mountains June 26, 1933; vomiting and high fever were recorded until he was hospitalized July 1. Chief symptoms—highest temperature 104.4°, remittent type, enlarged tender inguinal, axillary and cervical lymph-nodes; a punched out ulcer ½ cm. in diameter on the back in the region of the twelfth dorsal vertebra; pin-point papule on the abdomen left upper quadrant; July 22 normal temperature; uneventful recovery. Laboratory examination of cultures from the ulcer revealed Gram-negative bipolar bacilli; since the cultures were lost, no definite identifications have been made. The blood serum repeatedly tested by several laboratories failed to agglutinate *Bact. tularense,* but on the 39th day after the onset specifically clumped *P. pestis* in a dilution of 1:80 (4+) and 1:160 (3+).

In retrospect, the illness of this boy is correctly diagnosed as *Pestis minor* with a cellulo-cutaneous necrosis. Survey activities and post-mortems conducted in the Big Bear region during September and October on 1,302 rodents (406 Fisheri squirrels, 128 Golden-mantled chipmunks) failed to reveal one single plague infection. However, *2 pools of fleas, 1 of 104 insects collected in August from 38 Citellus beecheyi fisheri and another of 31 fleas from 24 squirrels shot in October in the Holcomb Valley infected guinea pigs with P. pestis.* The demonstration of infected fleas in the San Bernardino area not only supports

the anamnestic diagnosis made on the above case but also establishes the source of infection of a fatal case of human plague seen in a 67 year old male in 1933. Epidemiologically the evidence favored exposure to plague in the Big Bear region where the man owned a cabin; but since no infected squirrels had been found during the extensive surveys made from 1933 to 1936, the correctness of the epidemiologic reasoning was questioned. The examination of fleas solved one of those irksome riddles continuously encountered in the elucidation of sylvatic plague.

Utah—Early in July Dr. M. J. Macfarlane from Cedar City, Utah, submitted to the Hooper Foundation a specimen of pus removed from the axillary bubo of a 7 year old boy. The examination yielded an abundance of plague bacilli. From the history the following data are of general interest. June 24, 1936, the boy had been bitten on the left thumb by a squirrel. He was hospitalized June 29 with a high temperature and a provisional diagnosis of tularemia. Symptoms of meningismus, meningitis, and diphtheria dominated the early clinical picture. Subsequently, extensive maculopapular eruptions over the trunk and limbs with necrosis and suppuration accompanied by 5 buboes—1 in the left axilla, 2 in the cervical and 2 in inguinal regions—made their appearance. A typical bronchopneumonia accompanied these septicemic manifestations. The boy eventually recovered and was discharged from the hospital after 54 days. A critical analysis of this case leaves no doubt that similar observations may be made any time and anywhere and that the nature of the successive clinical diagnoses of meningitis, diphtheria, streptococcic sepsis, and tularemia may be clarified only by proper laboratory examinations.

Through the subsequent survey activities of the U. S. Public Health Service, the existence of sylvatic plague among the squirrels (*Citellus grammurus*), marmots (*Marmota flaviventris englehardti*) and prairie dogs (*Cynomys parvidens*) was fully proved.

The observations on 5 human plague cases in 1936 may be summarized as follows:

1. Despite the serious septicemic nature of the infections, the patients made uneventful recoveries. The plague strains involved possess the same infectiousness for guinea pigs as established for other cultures isolated from man and rodents during 1933 to 1935.

2. In 4 of the 5 cases direct contact with squirrels and other rodents was established. It is significant and noteworthy that the histories fail to report flea bites.

3. The importance of early laboratory examinations of the blood, aspirated lymph-node juice and pus, by experienced bacteriologists and serologists is again emphasized. The value of the diagnostic serologic examination of the blood serum of patients suspected of plague deserves recognition.

4. From a preventive point of view, it is imperative that the public, particularly youths, be warned not to handle sick or dead rodents in the regions in which sylvatic plague has been recognized. The character of these warnings should be judiciously worded in order to prevent harm to the summer resorts and to avoid criticism by the uninformed.

B. RODENT PLAGUE

1. *California*—Accidentally a squirrel (*C. beecheyi*) with sub-acute plague was found by the Agricultural Commissioner in an area adjacent to an old sylvatic plague focus in Ventura County. The examination of 104 squirrels and 2 rats (*R. alexandrinus*) were negative for plague but *a pool*

of 317 fleas collected from 25 rodents was proved to carry P. pestis by animal inoculations.

The plague area discovered in 1934 in Northern and Eastern Modoc County is slowly extending south, and on the west it reached into the vicinity of a CCC camp. A total of 7,998 rodents (7,244 *C. oregonus,* 38 ground-hogs, etc.) have been examined and plague demonstrated in 40; 14 new ranches were recognized as sylvatic plague foci. In the territory covering these ranches 1,110 rodents were examined and *P. pestis* demonstrated in 40 or 3.5 per cent. Over 145 carcasses were picked up and although unfit for examination are gravely suspicious for plague; thus the percentage of diseased squirrels is close to 15 per cent. Only 5 of 67 pools of fleas yielded plague infections in guinea pigs on inoculation.

In the Big Valley District in Lassen County 3 new plague areas were discovered. Again the infection rate was low (0.9 per cent) in the 748 squirrels shot, but since 118 suspected carcasses had been found it is not unlikely that the incidence is closer to 14 than to 0.9 per cent.

Infected fleas have been collected from squirrels, chipmunks, chickarees, etc., in San Bernardino and Placer Counties, although gross anatomical lesions of plague have not been discovered in the 1,900 rodents autopsied in these counties.

Renewed sylvatic plague activity has been noted in Santa Cruz County. In an old focus which was found infected in 1927 and 4 new districts, the epizoötic was quite extensive. The disease incidence varied from 5 to 8 per cent (87 diseased squirrels were found among 1,577 *C. beecheyi* shot within and adjacent to the area). Seven of a total of 28 pools of fleas infected guinea pigs.

In this connection attention is drawn to the interesting fact that despite intensive surveys in the Kern and Tulare areas which were heavily infected in 1934, no diseased squirrels or *P. pestis* carrying fleas were discovered. The available data rather forcibly suggest that a new area may be active for sylvatic plague over a period of 1 to 2 years and then remain apparently silent for 5 to 8 years. Thus the C. Ranch in Santa Cruz County shows the following record:

August 29, 1927—2 infected squirrels
1930, 1931, 1932—Negative findings
1933, 1934, 1935—Negative findings
June 22, 1936—2 infected squirrels
June 26, 1936—8 infected squirrels
June 30, 1936—8 infected squirrels

Although the active suppressive measures may in part be responsible for this behavior, a number of other possibilities deserve further investigation.

2. *Idaho*—The field laboratories of the State Department of Public Welfare and U. S. Public Health Service started surveys on June 2, 1936, and covered 5 western and 5 eastern counties. In 2,119 rodents 27 revealed lesions suspicious of plague. Dr. C. R. Eskey demonstrated *P. pestis* in 108 fleas from 123 *Citellus armatus* shot on one ranch in Bonneville County, June 9–12. Mass inoculations of tissues from 2 *Citellus armatus* shot on June 23 on same ranch proved *P. pestis*. Mass inoculation of material 5 *Citellus armatus* (3 found dead and 193 fleas from 75 squirrels shot at the E. A. Ranch, Bonneville County, Ida., infected guinea pigs and *P. pestis* was isolated.

3. *Montana*—July, 1936, Dr. C. R. Eskey, U. S. Public Health Service, reported that fleas and lice taken from 7 groundhogs (*Marmota*) at the head of Small Horn Canyon, Beaverhead County, infected guinea pigs with typical plague (existence of plague in ground-hogs demonstrated for the first time).

4. *Nevada*—Sylvatic plague has been found in Elko County by inoculating fleas taken from 50 *Citellus oregonus* shot May 7, 1936, on a sheep ranch 8 miles northeast of Lamoille, Nevada. Dr. Eskey reports that the laboratory truck left Nevada shortly after the positive diagnosis of plague was made and did not return until the latter part of June. Therefore, not much work has been done to discover plague in ground squirrels of Elko County.

5. *Utah*—July and August the Public Health Service—Dr. C. R. Eskey—demonstrated plague infection in 1 *Citellus grammurus* found dead in Beaver Canyon, Beaver County, Utah, July 16, 1936; 1 *Citellus grammurus* found dead in Indian Creek Canyon, Beaver County, Utah, July 27, 1936; 315 fleas from 11 *Citellus grammurus* shot 11 miles northeast of Cove Fort, Sevier County, Utah, July 28, 1936; 1 *Marmota flaviventris englehardti* killed with a club in Indian Creek Canyon, 15 miles northeast of Beaver, Beaver County, Utah, July 31, 1936; 2 prairie dogs (*Cynomys parvidens*) shot August 6, 1936, 5 miles northeast of Panguitch, Garfield County, Utah; and 45 fleas from 23 prairie dogs (*Cynomys parvidens*) shot August 7, 1936, on Porter Ranch, 2 miles east of Hatch, Garfield County, Utah.

The survey studies made throughout the western states since 1908 and particularly since 1934 have conclusively proved that the rodents listed in Table I-A suffer from spontaneous plague. Those presumably suffering from spontaneous plague since infected fleas have been removed from their bodies are shown as Table I-B.

Experimentally, the susceptibility of the ground-hog (*Marmota flaviventer*), chipmunk (*Eutamias amoenus amoenus*), Sierra Nevada golden-mantled ground squirrel (*Callospermophilus chrysodeirus chrysodeirus* [Merriam]) and True white-footed mouse (*Peromyscus truei truei* [Shufeldt]) has been established.

The survival (in days after percutaneous (scarification) infections conducted in July and August were as follows:

Control guinea pigs: 4, 4, 5
Oregon squirrels: 4, 4, 5, 5, 3, 6, 6, 6, 5, 10, 1 survived
Chipmunks (*Eutamias*): 3, 3, 3
Sierra Nevada golden-mantled ground squirrels: 3, 3—cannibalism 3, 3
Ground-hogs (*Marmota*): 8, 10, 9, 2 survived
Peromyscus truei: 3, 3

Of interest are the susceptibility tests on ground-hogs made before spontaneous plague had been demonstrated in these rodents. Irrespective of the

TABLE I-A

Rodents that suffer from spontaneous plague:

Sciuridae	Beecheyi ground squirrel	*Citellus beecheyi*
	Oregon squirrel	*Citellus oregonus*
	Utah spermophile	*Citellus armatus* (Nevada and Idaho)
	Rock squirrel	*Citellus grammurus* (Utah)
	Columbia squirrel	*Citellus columbianus* (Oregon)
	Richardson squirrel	*Citellus richardsonii* (Montana)
	Yellow-bellied marmot	*Marmota flaviventris englehardti* (Utah)
	Tahoe chipmunk	*Eutamias quadrivittatus frater* (Allen)
	Utah prairie dog	*Cynomys parvidens*
Muridae	Gilbert white-footed mouse	*Peromyscus truei gilberti* (California)
	Western bushy-tailed wood rat	*Neotoma cinerea occidentalis*
	Intermediate wood rat	*Neotoma lepida intermedia*
	Dusky-footed wood rat	*Neotoma fuscipes*

TABLE I-B

Rodents presumably suffering from spontaneous plague since infected fleas have been removed from their bodies:

Fisher squirrels	*Citellus beecheyi fisheri*
Sierra Nevada chickaree	*Sciurus douglasii albolimatus*

site of infection—abdomen or lower hind legs—the days of survival varied between 8 and 10. The pulmonary involvements were quite extensive, in 1 instance accompanied by numerous intestinal ulcerations due to plague bacilli which doubtless had been swallowed in the tracheal mucous rich with *P. pestis*. Experiments on hibernating Oregon squirrels indicated slightly prolonged periods of survival. Following the usual scarifications, the animals succumbed to septicemic plague in 6 to 8 days. Susceptibility studies on rodents caught in old sylvatic plague foci are too limited to warrant conclusions.

C. VECTOR AND FLEA TRANSMISSION STUDIES

In accordance with the program suggested by Dr. C. R. Eskey, a number of studies have been undertaken. In California an attempt was made to collect large numbers of fleas and test the emulsions of the crushed insects by guinea pig inoculations. The fleas, which have been killed with chloroform, were combed from the cadavers of the wild rodents. They were transferred to physiological salt solution (in summer a 3 per cent salt solution is preferable in order to suppress bacterial growth) and shipped to the laboratory. As a rule, they were washed in sterile salt solution then ground in a mortar. The suspensions were injected subcutaneously into guinea pigs. For the sake of economy large pools of fleas collected from squirrels of a given area were so treated. A total of 338 pools covering 17,588 fleas collected from 6,839 squirrels, 719 rats, 38 groundhogs, 75 chipmunks, and 163 mice have been tested by this new procedure. The following important findings deserve recording:

Modoc County — Active plague area; 5 of 67 pools infected guinea pigs with plague.

115	fleas	from	12	Oregon	squirrels
33	"	"	104	"	"
45	"	"	178	"	"
144	"	"	137	"	"
37	"	"	139	"	"

Monterey County—Pool of 259 fleas from 58 *C. beecheyi* proved infectious.

Placer County—Seven of 73 pools collected from squirrels shot in infected areas contain fleas carrying *P. pestis*. Three pools prepared from 23 lots of fleas induced plague in guinea pigs as follows:

65 fleas from 9 *Eutamias*, 13 *Peromyscus*, 5 *Neotoma*, 1 *Sciurus* and 1 *Callospermophilus*

75 fleas from 8 *Sciurus*, 10 *Callospermophilus*, 5 *Eutamias*, 13 *Peromyscus* and 1 *Neotoma*

22 fleas from 1 chickaree (*Sciurus douglasii*)

San Benito County—On a ranch found infected in 1927 and annually examined for diseased rodents, a pool of 285 fleas selected from a larger collection removed from 122 squirrels proved infectious for guinea pigs.

San Bernardino County—Two of 42 pools carried fleas with plague bacilli. A pool of 104 fleas from 38 *Citellus beecheyi fisheri* infected guinea pigs and a pool of 31 fleas from 24 Fisher squirrels, both from localities in which continued post-mortem examination of rodents had failed to reveal plague, proved to be infected with *P. pestis*.

Santa Cruz County—Seven of a total

of 35 pools of fleas collected from diseased and apparently normal squirrels infected guinea pigs.

Ventura County—One pool of 317 fleas from 23 rodents carried *P. pestis*.

The significance of these results must be emphasized. Without the examination of fleas, the epidemiology of 2 human cases would have remained unsolved and the existence of sylvatic plague in 2 counties would doubtless be unknown. Furthermore, the demonstration of infected fleas on Fisher squirrels and 1 chickaree stigmatizes these 2 rodents as possible spontaneous hosts of plague. As a tool in the course of sylvatic plague surveys, the testing of fleas will prove of inestimable value. The few observations available also indicate that this method of examination will be useful in studying the persistence or disappearance of sylvatic plague from areas in which the disease has been active. It was always suspected that the search for diseased squirrels or other rodents is quite limited since many of the infected animals may rarely leave their subterranean burrows. By a judicious selection of the pools of fleas doubtless more information may be collected. The few promising results amply justify the increased cost and labor which the surveys of the future may entail.

Obviously, the flea surveys must be supplemented by identifications and numerical estimates of the species of fleas which are found on the rodents during the different seasons of the year. In California, a few preliminary attempts have been made with the assistance of Dr. M. A. Stewart, Assistant Professor of Entomology, College of Agriculture, Davis, Calif. Some identifications clearly indicate the complexities which will confront the biologist in determining the plague transmitting capacities of the different species of fleas which may be encountered.

In August, 1936, the Beecheyi squirrels in Monterey County were infested with *Hoplopsyllus anomalus Bak. and Diamanus montanus Bak.* in the proportion 57:68.

In July, 1936, the Oregon squirrels in Modoc National Park were infested as follows: *Oropsylla idahoensis* (Bak.) 71, *Thrassis acamantis* (Roths) 5, *Diamanus montanus* 3, and *Monopsyllus wagneri wagneri* (Bak.) 1.

The classifications of fleas taken from rats caught in Salt Lake City and vicinity during the month of September by Dr. C. R. Eskey disclosed the important fact that *Xenopsylla cheopis* was present in considerable numbers among the insects removed from the rodents caught in the vicinity of the city. Should squirrel plague occur in the areas where these fleas were found, the danger of an epidemic of rat plague would unquestionably be great. Human cases would be much more likely to follow plague infection among the domesticated rats. These and similar observations merely sketch the many potential ramifications which require detailed investigations.

Concerning the ability of these different species of fleas caught on wild rodents to transmit plague to man nothing is known. Already in connection with the discussion of human plague histories collected in 1936, it has been emphasized that the flea appears to play a decidedly subordinate rôle. Again attention should be called to the fact that among the personnel of the survey crews who have for years been exposed to fleas which in the light of the recent observations were infected, no case of plague has been observed. These and similar considerations have prompted Dr. C. R. Eskey, U. S. Public Health Service, to conduct a series of fascinating and promising experiments. Although it is anticipated that he will personally report his far-reaching preliminary findings,

it may not be out of place to mention one fact he so kindly gave me. The squirrel flea—*Hoplopsylla*—will attack man in very rare instances; even bite-transmissions to guinea pigs appear to be very difficult. While "blocking" of the proventriculus of the rat flea—*Xenopsylla cheopis*—is a proven fact and regurgitation of plague bacilli into the bite is the actual mechanism of transmission, Dr. Eskey has shown that in Diamanus "blocking" is not commonly observed; but the fecal droppings are infectious. In all probability the excreta of the insects are principally concerned in the transfer of *P. pestis* from the vector to the rodents and perhaps to man. These newer concepts greatly clarify the epidemiology of sylvatic plague and in part at least explain the very low incidence of human plague, despite the extensive reservoirs which have existed in many regions throughout California and the West. A study of the bionomics of the wild rodent fleas and systematic identifications of the insects found on squirrels in the vicinity of human habitations may furnish data concerning the possible exchange of vectors. That rat fleas may infect themselves on diseased squirrels and thus ultimately bring rural plague to man must be admitted and subjected to experimental inquiry. The problem of infected and infective fleas and the mechanism of transmission influenced by temperature and humidity is only a part of the sylvatic plague problem, but it is, in the judgment of everybody, the most important one, and the committee trusts that Dr. C. R. Eskey will pursue his auspicious researches with every possible assistance that can be given to him. Equally important is the solution of the problem relative to rôle of the vectors not merely as transmitters of infection but in carrying over the disease agent from one plague season to another.

D. BACTERIOLOGICAL STUDIES CONCERNING THE ORIGIN OF PLAGUE IN CALIFORNIA

It is quite generally believed that the West Coast of North America became infected in the course of the pandemic of 1894 which originated in Hong-Kong. Probably rats conveyed the seed to the shores of California and gradually spread it to squirrels, and from squirrel to squirrel the disease has assumed its easterly march as far as Montana. This interpretation of the available facts has received considerable support through comparative bacteriological tests which Dr. K. Kuraichi from the Manchurian Plague Laboratory conducted at the Hooper Foundation. He had previously established the important fact that the plague strains isolated in Manchuria, Mongolia, and Russia ferment glycerine, while those obtained from China, Japan, India, and Italy are unable to utilize this alcohol. While studying 23 recent and old cultures of *P. pestis* isolated in California, he found that they were glycerine negative (Beta type). In comparing the data available for 15 strains studied by Dr. W. M. Dickie and his associates 1924–1925 which were also glycerine non-fermenters, Dr. Kuraichi concluded that these cultures were descendants of the great pandemic strain which has spread to India, Argentine, South Africa, etc., by shipments and that the sylvatic plague of the North American Continent had no connection with similar endemic foci of Transbaikalia, Mongolia, or Southeastern Russia. This interpretation of these bacteriological findings deserves further attention although the impression conveyed by Russian and Japanese workers that glycerine positive strains are confined to Mongolia and East Russia is in part invalidated by the findings of Alpha type in South Africa by Pirie. Dr. Kuraichi's observations are suggestive but not conclusive.

Public Health Legislation*

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REGULATION of public health matters by legislative fiat has been the prerogative of governing bodies in this country for nearly 300 years. As early as 1647 a quarantine act was passed by the Governor and Company of Massachusetts Bay, in order to avert a threatened epidemic of yellow fever, which was then raging in the West Indies.

This act was the first sanitary legislation in North America of which we have a record. It was soon followed by numerous other laws adopted by the various colonies for the control of the ever-prevalent smallpox, for the suppression of nuisances, and for the prevention of yellow fever by means of maritime quarantine.[1]

After the adoption of the Constitution of the United States in 1789, by the terms of which the control of the public health was continued as a function of the individual states, the Massachusetts Legislature passed in 1797 the first comprehensive act for a system of local health administration. Under its provisions, a board of health was organized in Boston, with Paul Revere as president. Philadelphia had set up such a local board in 1793, when a great epidemic of yellow fever occurred, and New York had a similar organization in 1796, although of a somewhat temporary and desultory nature.

In 1855, during another of the terrible visitations of yellow fever, Louisiana created a temporary state board of health to act as a quarantining authority. The first real state board of health, however, was established in Massachusetts in 1869, nearly 20 years after such a procedure had been recommended in a notable document prepared by a statistician and educator, Lemuel Shattuck, who was chairman of the Massachusetts Sanitary Commission.

THE PURPOSE OF GOVERNMENT

In this report, which has been characterized as one of the greatest productions of sanitary statemanship, it is declared:

> The condition of perfect health requires such laws and regulations as will secure to man associated in society the same sanitary enjoyments that he would have as an isolated individual; and as will protect him from injury from any influences connected with his locality, his dwelling house, his occupation, or those of his associates or neighbors; or from any other social causes. It is under the control of public authority and public administration; and life and health may be saved and lost, and they are actually saved or lost as this authority is wisely or unwisely exercised.

This cogent statement, written in 1850, is an excellent text for any discourse on public health legislation.

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* Read at the Eighth Annual Meeting of the Western Branch American Public Health Association in Phoenix, Ariz., April 15, 1937.

Government is, of course, organized for the purpose, among its other functions, of protecting and preserving the health and promoting the general welfare of its citizens. The sovereignty, as exemplified in this country by the state, cannot divest itself of this important duty, but it may delegate the execution of this power to its political sub-divisions, such as counties, municipal corporations, school districts, and local boards of health.[2]

Today every state has enacted public health legislation. Except in one or two particulars, such as vital statistics laws, this health legislation is as diverse as are the states themselves. There is no uniformity in the form and substance of these laws, and not much standardization in their mode of operation. Distinguished public health visitors from abroad are, in fact, bewildered and somewhat critical of the variety of health legislation and public health practices that may now be observed and encountered in our 48 sovereign states.

Although all progressive sanitarians will agree with the maxim attributed to one of the several Earls of Derby that, "Sanitary instruction is even more important than sanitary legislation," it is true, nevertheless, that effective laws are essential to sound public health administration. Despite some recent developments in the political science of this country, we are still living under a democratic form of government founded on the principle that it is one of laws and not of men.

Under the American plan of government, which is based on the wise theory of a separation of powers, laws are considered and then promulgated by the legislative branch of the government. These statutes are then turned over to the executive branch of the government for administration and enforcement, and the legislature has no further concern with them, except to amend or repeal the laws as public policies may dictate.

FUNCTION OF THE COURTS

All legislation and the manner of its enforcement are, however, subject to review by the third coördinate branch of the government, the judiciary. It is the duty of the courts to pass upon the constitutionality of laws, to interpret them in the interests of justice, and to rule upon their validity whenever actions are properly brought before them. By this means, and only by this means, may the constitutional rights of individuals be safeguarded. With the wisdom of legislation, the courts are in no way concerned, but with its propriety under the federal and state constitutions they are, and should be, very much concerned.

Since 1827, when an American tribunal first upheld a sanitary ordinance,[3] the courts in this country have been liberal in sustaining all reasonable public health legislation, and in upholding the proper actions of health officials under the laws. The courts have universally recognized the rights of the states under their reserved police power to regulate lives and property, to restrain personal liberty, and to take summary measures in the proper interests of the public health.

The courts have recognized these privileges and duties of the states even when they have come in conflict with provisions of the federal constitution, but only when there was a reasonable necessity for action in behalf of the public health. When health laws, regulations, or procedures have been unreasonable; have discriminated improperly between persons or classes; have denied due process of law, the equal protection of the laws, or freedom of contract; or have capriciously interfered with interstate commerce, they have been nullified by the courts.[4]

Public health law in this country is,

therefore, not merely a matter of legislative enactment and executive administration, but it is also court-made law. The judiciary examines legislation and evaluates administrative procedures in accordance with constitutional limitations and the precedents of the common law. Sanitarians must be broadly familiar with these legal principles, as well as with the contents and texts of the statutes that apply to their official duties.

In 1923, for example, the Supreme Court of Arizona had before it an ordinance of the town (now the city) of Yuma with reference to the production of pure milk, and the prevention of adulteration of this important and indispensable food. The appellant, who had been convicted in a police court of offering to sell milk containing boric acid, alleged that the town had no authority to pass the ordinance; but the court held that this power was conferred in the charter granted by the legislature and in the laws of the state, even though milk control was not specifically mentioned.[5] This court declared:

> It would be a vain thing to provide by law for a municipal board of health and not empower the corporation to take necessary steps to aid it to preserve and protect the public health. Taking sub-section 28, *supra*, and the law creating boards of health, and construing them together, we think impliedly, if not directly, the legislative body of the town of Yuma had power to license and regulate the sale of milk and its products within its limits, and to forbid its adulteration, and to punish those violating ordinances enacted for that purpose.

THE SCOPE OF HEALTH LEGISLATION

Legislation includes state laws, municipal ordinances, and the rules and regulations made by executive departments in conformity to law. Although the legislature is the only branch of government that actually can make a law, and it cannot delegate this power to make laws, the legislature can delegate the power to make rules and regulations to carry out the intent of the statutes. Such proper rules and regulations have all the force and effect of law, although they may be more rigidly construed by the courts than are the enactments of legislative bodies.

Today there is a profusion of public health legislation in this country. In each state the health laws, sanitary codes, and the rules and regulations of the state health department are printed in ponderous and uninspiring volumes requiring hundreds of pages. In addition, there are innumerable ordinances and local regulations on health, some of which are available in printed form. Supplementary to this unwieldy mass of written legislation are more than a thousand court decisions on public health, which form the so-called unwritten law on this subject.

Despite this prodigality of legislation on health matters, the public health laws in many states are inadequate and insufficient. Not only is there the great variation in the provisions of the laws in the different states, but in many instances legislation that is obsolete, obsolescent, or unenforceable remains on the statute books. It is a cardinal principle of efficient government that no law or regulation should be enacted unless it is enforceable and unless there is a sincere intention to enforce it vigorously and impartially.

In every state a survey of public health legislation and an appraisal of the status of public health administration throughout the state should be made at periodic intervals, certainly at least every 10 years. This has been the regular procedure in such progressive commonwealths as Massachusetts and New York, which have long been recognized leaders in the field of public health. A survey of this nature may logically be undertaken under the aus-

pices of a special state commission authorized by the legislature and appointed by the governor, or it may be conducted by public health experts employed under the supervision of an appropriate state committee. Arizona, which has had a state health organization only since 1903, is to be commended for its recent action in making a public health inventory of the current public health situation in this state.

REVISING HEALTH LEGISLATION

As a result of professional appraisals of this type, suitable health legislation can be prepared for the consideration of the state legislature. Proper bills embodying effective public health procedures and administrative organization should be drafted by a committee of experts, including authorities on the scientific aspects of public health, authorities on law, and authorities on rhetorical expression, since clarity, brevity, and simplicity are essential features of all good legislation.

Assistance in these endeavors may sometimes be obtained from state legislative drafting services, and opinions as to the legality of proposed measures may often be secured from the state attorney general. Unfortunately, there is at present no national source of adequate information on public health legislation. The U. S. Public Health Service has collected and published some valuable data on the subject, but it is not the function of this federal bureau to promote, prepare, or even to advise on state legislation, unless directly invited to do so by the state authorities.

In a paper presented before the American Public Health Association 14 years ago, the author made some practical suggestions for the much needed coördination of the public health laws of the United States, and proposed that there be organized under suitable auspices a national bureau or institute of public health law.[6] Since that time, reliable information on various legal aspects of public health has been made available from different sources, but not much has been accomplished in bringing order out of our present legislative chaos in the public health field.

CODIFICATION OF PUBLIC HEALTH LAW

A national institute of public health law should survey and appraise all existing legislation pertaining to health, and should examine critically the rulings of the courts on this subject. As a result of such a study, there should be prepared the outline of a model state health code, which could be adapted to various local conditions. Supplemental to this there should be a model health ordinance for municipalities, which contains the essential features of a desirable law, but is sufficiently elastic to be useful under different local conditions.

Another function of the proposed institute on public health law would be to standardize the manner of presentation of pamphlet compilations of the health laws in the states. Most states issue such documents, which are of some value in acquainting the public and local officials with the provisions of the laws, but most of these pamphlets are worthless to practising attorneys. They now often suffer from such defects as poor arrangement, complexity, lack of annotations to court decisions, indifferent indexes, bulk, typographical and other errors, and poor printing.

In addition to these duties, this proposed institute of public health law should be available for consultation and advice to harassed health officials who contemplate legislative activities or who are confronted with litigation in the courts. The institute should not, of course, attempt to act as a substitute for competent local attorneys, but should merely be expert counsel in a

specialty that requires unusual knowledge and special facilities.

Such an institute might be organized under the auspices of the American Public Health Association or the National Health Council, or it might be connected with one of the leading schools of public health, with university background. It should, of course, be adequately financed for a continuing period, and properly housed and staffed.

This plan offers a practical solution to the problem of improved public health legislation in this country. The problem is not a new one, for as early as 1875 the American Public Health Association appointed a committee under Dr. John Shaw Billings to develop a method for the appraisal of public health activities. Included in the report of this committee was a section on public health laws, regulations, and officials-municipal.

In England, where public health authority is centralized in the national government, in contrast to its almost complete decentralization in the United States, a codification of the public health laws is now in progress. Codification of the public health law in this country is equally desirable, and would represent a most valuable contribution to modern public health administration and practice.

About a decade ago, Dr. Charles V. Chapin wrote:

> Few health officers entering upon their work know much about law, or even about the structure of our government. The propagandists of great health movements are likely to know even less. They may fear that human nature may interfere somewhat with law enforcement, but they little realize the legal impediments in the way of securing the prompt adoption of their rules. It never occurs to them that the Federal Constitution may be in their way, or their state constitution, or some existing statute, or possibly a municipal ordinance. Still less do they realize the power of the courts. . . .[7]

The successful administration of public health activities is founded upon the existence of adequate, reasonable, and competent health legislation. Public health officials must, of course, be scientists as well as statesmen, but as statesmen they must realize that humane and workable laws are the real basis of a successful democratic government.

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Modified Methylene Blue Reduction Technic*

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ONE of the outstanding advantages of the methylene blue reduction test (A.P.H.A. 1934) [1] is that, while the interpretation of results should be made only with an adequate knowledge of the available information pertaining to the test, the technic of operation may demand a less exact training than either the agar plate or microscopic counts. For this reason the methylene blue reduction test has been useful in many situations where otherwise bacteriological control of the milk supply would be difficult or impossible. Therefore, any extensive complication of the technic of the test should be adopted as standard on this continent only on presentation of proof that the modification compensates with greater accuracy.

Skar (1913),[2] observed more uniform reduction when the tubes of milk were shaken during incubation. Thornton and Hastings (1927, 1930),[5, 6] Johns (1930),[3] Thornton (1933),[4] and Wilson (1935) [7] all used the shaking modification which, on Wilson's recommendation, has become the standard technic in Great Britain. Such shaking results in decreased reduction times in most better-class milks and lessened variability in replicate samples as well as uniform disappearance of the dye in the individual tubes. Each of the last 4 workers cited has expressed belief in the greater accuracy of the shaking technic although none has yet substantiated his opinion with acceptable proof or successfully measured the extent of greater accuracy.

The main criterion of accuracy which these workers appear to have accepted as adequate is the comparative degree of variability in replicate tubes subjected to the two tests. It should be pointed out that variability is only one component of accuracy and probably constitutes a very incomplete measure of the accuracy of either test. There can be no doubt that the absolute accuracy of either test, or their comparative accuracies, still awaits determination.

If it can be shown that there is a high correlation between the results of the two tests, there can be little difference in their average accuracies. A coefficient of correlation between the results of the standard and modified methylene blue reduction tests calculated for 332 market milks of many classes was found to be 0.94 ± 0.004. Consequently neither test greatly ex-

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cels the other in accuracy, despite the greater variability displayed in the standard test which may lead to inaccuracy in evaluating an individual milk.

It is probable that the proposed shaking modification would complicate the test to the extent that uniform technic would be improbable in the hands of some who are at present satisfactorily performing it. Since compensation by greater accuracy is not apparent, the writer can find no justification for adopting the modified test as standard on this continent.

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New Home of the Mellon Institute

THE new home of the Mellon Institute in Pittsburgh was dedicated on May 6. This Institute is "a guild of scientists provided with facilities for productive effort and for mutual aid, coöperation, and protection in investigating thoroughly problems of importance in pure and applied science." In a booklet called "Symbolism in the Mellon Institute" there is described a series of medallions representing the scope of scientific research. These medallions bear the emblems of American scientific and professional societies, representative of the principal fields of science and technology. "These medallions, which signify the general character and breadth of the Institute's recognition of, indebtedness to and collaboration with these organizations and their realms and also the scope of scientific research, both pure and industrial," are here described. Three medallions are centrally located on the floor of the vestibule and typify chemistry (American Chemical Society), chemical engineering (American Institute of Chemical Engineers), and physics (American Institute of Physics). The other ten medallions are placed in the aisle space separated from the main lobby by the columns, occupying center positions among these columns. Science in general is indicated by the seal of the American Association for the Advancement of Science. Sanitary science, public health, and industrial hygiene are represented by the seal of the American Public Health Association. Pharmacy, pharmaceutical chemistry, pharmacology, and drug technology are represented by the American Pharmaceutical Association seal; while medicine is represented by the emblem of the American Medical Association.

The following aspects of research in public health have been carried on by the Institute: municipal smoke and dust control, factory air hygiene, sleep and sleeping equipment, various nutritional problems, dental hygiene, and the hygienic aspects of cooking utensils, dishwashing, laundering, and dry-cleaning. Other investigations have pertained to disinfectants and insecticides.

Standardization of Tablets for Determining Methylene Blue Reduction in Milk*

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AS the first extensive use of methylene blue reduction as a test for the sanitary quality of milk was in Denmark, it is natural that the first effort to prepare standardized tablets for this test should be made in that country. Tablets for this purpose were on the Danish market before 1920, and samples of them were obtained for investigation in this country between 1920 and 1924. A sample furnished the Stain Commission in 1922 was analyzed and found to contain an average of 20.2 mg. actual dye per tablet, giving a dilution in milk when prepared according to instructions of 1:400,000. Two years later, Hastings (1924) published a report on the comparative strength of several different lots of tablets. He did not give any determinations of actual dye content but gave figures as to the relative strength of 2 lots of Danish tablets compared with 3 lots of American tablets prepared in 1923. As the actual dye content of these latter is known, it is possible to compute from Hastings's data with a fair degree of accuracy the amount of methylene blue contained in the 2 lots of Danish tablets. In this way, Hastings's sample No. 1 contained about 30 mg. per tablet, and his No. 2 about 22.5 mg. per tablet. These would give dilutions of 1:270,000 and 1:360,000, respectively, in milk. These tablets, the bulk of which consisted of sodium chloride, crumbled easily, which was undoubtedly responsible for some of the variation; it may well have accounted for such a difference as that between the 2 lots computed to contain 20.2 and 22.5 mg. per tablet. Such a difference, however, as that between Hastings's samples No. 1 and No. 2 seems too great to be accounted for in this way.

Apparently there was considerable variation in the strength of the Danish tablets on the market in the early 1920's. This variation is even more striking today as a new lot of Danish tablets was analyzed in 1935 and found to contain only 14.6 mg. per tablet, giving a dilution of 1:555,000 when employed as directed. This last sample is apparently only half the strength of Hastings's sample No. 1 obtained from Denmark in the early 1920's.

In the meantime, Danish tablets have been used very little in this country because an American concern has been putting similar tablets on the market

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which have been approved by the Committee on Standard Methods of Milk Analysis, and each lot tested by the Biological Stain Commission. The American tablets are made up with a vehicle having greater binding power than the sodium chloride used in the Danish product. This lessens the crumbling and makes the tablets more uniform in weight.

The first American tablets were prepared in 1923 and were intended to duplicate the Danish tablets. The manufacturers were very successful in doing so and furnished tablets averaging 21.5 mg. each, which compared very closely with the 20.2 mg. found in the Danish sample submitted to them for duplication. When these tablets were put into experimental use, however, attention was called to the fact that in America the prevailing custom was to make the test in 10 c.c. of milk instead of 40 c.c. as called for by the Danish method. In order to insure the same dilution in the milk it was decided that the tablets should contain only one-quarter as much dye as the Danish. Such instructions were given the manufacturers when they prepared the first lot designed for actual use that were subsequently certified under the number NA-1.

When first preparing the tablets on a commercial scale the manufacturers were less successful in obtaining the desired dye content. The batch of tablets NA-1 proved to contain only 3.3 mg. each instead of between 5 and 6 mg. as desired. They, however, gave satisfactory results and were accepted without this discrepancy in dye content being especially noticed. The next 2 batches prepared, NA-2 and NA-6, were intended to duplicate the batch NA-1 and did so very closely. Unfortunately, each batch was a little weaker than the preceding, with the result that NA-6 contained only 3.03 mg. per tablet. This lot, as a matter of fact, produced such a weak coloration of the milk that serious objections were heard; and the company was requested to see that the next batch contained slightly more methylene blue. Batch NA-8, manufactured in 1934, contained an average of 3.57 mg.

Table I, giving the data in regard

TABLE I

Dye Content of Methylene Blue Tablets

Batch	*Weight of Tablet*	*Dye Content*		*Dilution in Milk as Used**
		Per cent	*Weight*	
Danish	grams		mg.	
Reported by Hastings (1924) No. 1	?	?	ca. 30	1:280,000
No. 2	?	?	ca. 22.5	1:375,000
From Breed (1922)	0.5	4.04	20.2	1:420,000
New Lot (1935)	0.57	2.25	14.6	1:580,000
American				
Exper. Lot (1923)	0.5	4.3	21.5	1:390,000
Cert. NA-1 (1923)	0.3	1.1	3.3	1:685,000
" NA-2 (1928)	0.32	0.99	3.18	1:715,000
" NA-6 (1931)	0.313	0.97	3.03	1:750,000
" NA-8 (1934)	0.313	1.14	3.57	1:635,000
Proposed New Standard	0.3	2.5	7.5	1:300,000

* Computed as follows:

$$\text{Dilution} = \frac{200 \text{ (grams water)}}{\text{grain dye}} \times \text{c.c. milk} \times 1.03 \text{ (sp. gr. milk)}$$

Final figures rounded for convenience

to these tablets, shows that the American tablets have been standardized to a very much greater extent than the Danish, and that the 2 most recent batches from each source tested have very nearly the desired ratio to each other of 1:4; thus the last American tablets give a dilution in milk of 1:625,000, and the last Danish tablets 1:555,000. The difference between these 2 lots when actually employed with milk is just barely detectable in the shade produced.

Recently Thornton, as referee for the Committee on Standard Methods of Milk Analysis, has pointed out that there are serious objections to methylene blue in the form of the chloride which has always been employed, largely because of the difficulty in standardizing the dye itself and in preventing its oxidation into other compounds that do not have the same action when used as an indicator of reduction. It is pointed out that this can be avoided by using methylene blue thiocyanate instead of the chloride. This recommendation is made as the result of work carried on by 6 or 8 collaborators who have tested a batch of this salt made on a semi-commercial scale by the manufacturers. Thornton and Sandin [2, 3] also recommend that the tablets in the future contain 7.5 mg. each, giving a dilution of 1:300,000 in milk, thus agreeing closely with the Danish tablets on the market about 1922. A comparatively small batch of tablets conforming with these recommendations and consisting of methylene blue thiocyanate has now been made by the manufacturers. Tests are being made to make sure that they conform in every respect with specifications recently drawn up by the referee.

Both of these recommendations have been acted upon favorably by the Committee on Standard Methods of Milk Analysis and by the Coördinating Committee on Standard Methods; and they are now being referred by the former committee to the Laboratory Section with the request that they be approved.* It is believed that the American manufacturers, with their experience in making such tablets for 12 years or more, and with the additional advantage of Thornton and Sandin's investigations, will be able to put out a very uniform product. It is hoped that the standardization of these tablets, begun about 15 years ago, is fairly definitely completed.

* Approved by Section, New Orleans, Oct., 1936.

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Technic of Radio Broadcasting in Health Education*

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FIFTEEN years have witnessed the development of a new medium through which the public may be educated, coerced, and prodded into new habits and new ways of thought and action. Not since the invention of movable types by Gutenberg in the 15th century introduced the age of practical printing and universal reading has such a powerful, far-reaching and logical tool been placed in the hands of those who would mold public opinion. Health workers more anxious to influence the health habits of our people than to increase their store of information, will, I believe, find the radio playing an increasingly important part in their educational work.

The first thing to consider is the audience. The radio audience is not a unit—there are many radio audiences. Each hour of the day has several different audiences. The people comprising them are like molecules, first in one combination, later in the day in another combination with molecules of another sort, having lost certain of their earlier associates and associations in the change. There is the audience of housewives, and the audience of shut-ins. Later in the afternoon there is the audience of returning school children; and the housewives have become mothers. Later there are a variety of dinner audiences—young men and women who want only certain comedy programs, fathers who want music or silence, children who want the serial programs; the housewives who became mothers have now become wives. There is the Sunday morning "home and children" group, and there are the Sunday afternoon entertainment seekers. So it goes. A dramatic serial about two young lovers and their marital difficulties was a failure at night—husbands just did not like the sentimentality and the wives were a little ashamed of their interest in the program. But the sponsors were aware of this interest and transferred the program to mid-day. The housewives relaxing from their tasks loved it, and it became the second most important program during the day. The ideal is to find the program which attracts every audience—each individual. Since this is impossible, aim your program at the specific audience you wish to reach, style it for their approval. Do not think that all health programs should be the same type.

The next thing to realize is that your audience, psychologically, is not a group at all. It has seemed to me that most educators on the air directed their message to that vast audience of millions that is known as "the Radio

* Read before the Western Branch American Public Health Association at the Eighth Annual Meeting in Phoenix, Ariz., April 13, 1937.

Public." Only two or three people will be gathered around most of the radio sets tuned to your station. Not only is the group you are addressing small, but each person in that group must be reached as an individual. With a theatre audience you first try to reach its members individually, both through intellect and emotion. Then you try to mold them into a unit, with individuality lost or forgotten in the emotional climax. This marks success in the art. Not so in radio. Your listener there refuses to lose his individuality. You do not have him completely under your influence; you are not aided by mass reaction. He has too many distractions. He is in his own home where the habits of thought founded on environment are too strong.

So you must prepare your program for this individual. But is not this individual different from what he might be in another setting than his home? As psychologists and students of advertising well know, certain aspects of a man's self are brought to the fore when he is alone, others when he is part of a crowd, others again when he is acting as a member of the family group. It is the "member-of-the-family" self to which the broadcast message must be directed. And since the family is the oldest, most universal, and most permanent social group, and the one which health workers are most anxious in influence, we are fortunate in having at our disposal the medium of radio, and should use it widely.

There are two general types of radio programs: musical and dramatic. Under these two classes broadcasters group all programs.

For our purposes it is unnecessary to examine closely the musical programs, but in passing it is wise to note two points. The first is that music is the backbone of radio production. It is only the exceptional dramatic program which will draw the typical listener away from a jazz or symphonic orchestra. Musical programs hold their listeners on the first broadcast; dramatic programs build up their audiences slowly, week by week.

The second point is that in the excellent, commercially sponsored dramatic programs, music serves as introduction, "Curtains" and mood creator, to paint character and describe the scene. Since the message is to the ear alone, it is necessary that this be so. On many of the dramatic programs, musical talent costs are as great or greater than the dramatic talent costs. Over the air a proper musical setting is probably that which most often distinguishes a professional dramatic program from an amateur production.

When preparing a radio program, it is wise to ask yourself how this program will enter the home of your listener. Your listener will have the radio tuned to your station, and you will follow the preceding program; or your listener will spin the dial and there you are. In either case, your program enters as a guest: a guest who does not overstay his leave any longer than it takes to flick the dial; a guest whose welcome is in keeping with the pleasure he can give and the grace with which he offers it. More than any other, your program is a guest who cannot afford to break the commandments of good manners, the first of which is: Thou shalt not offend or bore.

Your program should present to your listener quietly and pleasingly that in which he, as an individual, is interested while he is a member of the family circle. You might write an article which he would read in a different mood, but if you simply presented the same article on the radio he would, with reason, be irritated by your conduct.

Perhaps the best model for a radio program is a good conversaton with no one trying to monopolize the floor,

or press for the acceptance of his views. Of course, a radio program does monopolize the conversation, but it can be so prepared that it leaves a feeling that your views and your listeners have both been well discussed and you both enjoyed the visit.

Writing for radio is quite different from writing a magazine article or news story. In reality, you are writing a drama, even if it is to be a talk by one speaker. He must act the part of the guest sitting in the opposite chair. However, the drama you are writing will only be heard, not seen. You must lend to your listener your eyes. You must, with words, bring to your drama color, light and shade, distance, texture, form, mass and weight, and taste and smell.

Health educators often must use statistics. Presenting such figures to the radio public in all their stark nakedness is little short of indecent. The listener puts you down as an intellectual snob. It is wise to present your statistics in a humanized version carefully described so your listener can picture them in his mind. When speaking of medical apparatus or technics, it is best to liken them to objects and methods with which your listener is familiar.

Another point to remember in preparing a radio program is that listeners may tune in at any point, and tune out also. For those coming in you must frequently repeat the gist of your introduction. For those leaving you must early in the program present your conclusions. But all this must be done without sacrificing the sustained quality of the program, for the listeners who sit through the entire program are the ones you are most anxious to please. Perhaps the best formula is that classic for a successful sermon: "Tell 'em what you're going to tell 'em; tell it to 'em; and tell 'em what you told 'em." It is more difficult to follow this formula in a radio play than in a radio talk, but with care it is still possible to allow for this "processional" part of your audience.

Another factor that causes difficulty in the preparation of a radio program is that of a definite time limit. This limit is measured in seconds, not minutes. Remember it only takes 10 seconds for an automobile going 20 miles an hour to transverse a city block. Ten seconds of silence on the air is more than enough time for the listeners to dial another station. Ten seconds too much script is the most useless thing in radio.

Timing a program means reading it aloud, not under the breath, but in the voice that will be used over the air, allowing for all pauses and parts of the finished program. And when it is timed, it should be timed again, and again, and again, until an average reading time is determined. It may take 3 hours or more to time a 15 minute script properly and make the additions or deletions which are necessary, if the program in production is to "hit right on the nose."

A stop watch is very helpful when timing programs, and it is valuable to jot down at the bottom of each page the time reached at that point. In this way it is possible to know in production whether the program is running slow or fast, and allow for the speeding up or slowing down of the presentation as required. At the end of the script it is helpful to have a few paragraphs that can be dropped if necessary without losing the sense. These should be outlined in pencil, or in some other fashion marked off from the rest of the script, and their time, in seconds jotted in the margin. In this way it is possible, when the script has gone too slow in production, to drop a paragraph or part of a paragraph and start with the closing remarks at exactly the right second.

Do not time a program by figuring on the number of words or the number of pages of manuscript. Speakers differ in the number of words they can read a minute, and every speaker will vary his own reading time.

Radio scripts should be typed on the softest paper obtainable as a protection against noise, and the finished script should never be folded or wrinkled. When a program calls for the sound of a raging fire, sound effects men may produce this noise by crumpling paper before the " mike." You can see why it is important to exert every effort to prevent the rattling and crackling of scripts. Some radio stations even go so far as to type their scripts on a processed cloth. Many studios use a wax-filled paper. These special types of paper are well worth their slight extra cost.

Scripts should be typed with one or two spaces between lines, and an extra space between paragraphs or between the lines of different characters in a play or interview. They should of course be typed only on one side of the page. The large pica type should be used. Each paragraph should be complete on a page. Never run a paragraph over to a second page; rather use but half of one page and start the new paragraph on the next page. The same is true of each speech of a character in a play. If an actor must turn a page in the middle of his speech, he is almost sure to show it by hesitation in his voice. Another point: the words at the end of each line of the script should be complete; do not hyphenate them, but put the entire word on one line or the next. Smoothness of reading is necessary if the script is to sound like natural conversation in production.

Scripts can be handled easily if the sheets are not clipped together by carefully sliding off the used sheets and placing them behind the others or on a table that is handy to the speaker. Another good method is to put the script in a folder with the last page clipped to the folder top and bottom, and the other pages clipped at the bottom. In this way the pages are turned down, and cannot fall back as they often do if the script is clipped at the top. The pages turn with less noise and the script is easy to handle.

The straight talk is the simplest and most foolproof program. In such talks it is best to personalize your message by illustrating your points with human interest stories of people who are similar to the members of your audience. Bring your message home. Do not tell these stories as if they were case histories, but tell them as if you were discussing with your listener the problems of a mutual friend. Many a successful commercial program is no more than a straight talk, but one filled with human anecdotes.

Fifteen minutes on the air is a long time, and only a good radio speaker can hold the attention of his listeners for so long. It is therefore often wise to use two speakers on such a program, chosen to give a contrast in voices, personalities and opinions. In using 2 speakers, or 3 speakers on a half hour program, it is a good technic to have them tell one story between them, in order to connect the speeches, with the second speaker continuing the story or retelling it from a different viewpoint.

The interview form of program is effective, particularly when it develops into a discussion with the drama of conflicting ideas. In such a program 1 or 2 persons may be interviewed. The interviewer directs the questions and trends of the discussion. The interviewer is the audience personified. He should presumably know no more about the subject than your listener, be anxious to learn, yet quick to detect loose thinking or mistakes in the reasoning of the authorities he is questioning. The interviewer must satisfy

the ego of the listeners; he must say some of the clever things that pop into the head of the listeners; and he must occasionally trip up the bigwigs. All this without lowering the interview to the level of a hot argument, or disrupting its serious purpose. Such a program must be spontaneous, and, though this seems a contradiction, must be as carefully prepared as a radio play. Every line, every word, every clever spontaneous remark must be written beforehand, and the whole carefully rehearsed.

Do not confuse the question-and-answer program with the interview or discussion program. The two are not the same. The question-and-answer program is usually just an excuse to get 2 voices on the program, though occasionally it may be an effective form for presenting certain material. It has the advantage over the straight talk in that the points are sharply defined, and the answers, as it were, underlined. However, it lacks drama, and unless the listener is interested in the very questions asked, he will find little of general interest. This type, too, when used to present questions dealing with the diagnosis or treatment of disease, will too often resemble the program of the quack, and will draw letters impossible to answer, letters asking for diagnosis or prognosis of the ills of the writers.

We now come to the plays, or true dramatic programs. However, in passing, let us mention a transition type, the straight talk with dramatized sequences. In this form, the speaker may introduce a story; his voice then fades out and actors present a short scene. This type is used in many commercial programs and is very effective.

Similar to this is the use of other voices to present quoted statements, voices suggesting the authors of the statements. There is the typical doctor's voice, the lawyer's voice, the housewife's voice, the foreign scientist's voice. Using this type, the narrator may say, "as the eminent Viennese scientist, Dr. Von-Something-or-other, has said," and then the eminent doctor's voice-double gives the statement. Another use of this technic is to have 2 voices, distinctly different, alternately present points in a list of related statements, such as a set of health rules.

In a radio play, an announcer may introduce the program, set the stage, and change the scenes. It is better, however, to limit the announcements as far as possible, and let the lines of the characters describe the scenes. If you would write a radio play, study those which are presented by commercial sponsors—"One Man's Family" is one of the best of these. Through the study of Shakespeare's plays, you will find how the lines of characters may set the stage—stage settings as we know them were unknown in his day. Most of the Shakespeare plays simplified to their basic plots and characters, are extremely effective as radio dramas.

The number of leading characters in a radio play designed for a 15 minute period should be 3, and there should not be many minor characters. In a serial drama the number may be increased, though no more characters should appear in any one production. This is not a hard-and-fast rule, but a good one. Radio listeners find it difficult to separate many characters to whom they have just been introduced.

A change of scene is effective and refreshing and may occur several times in a 15 minute script if the scenes have a logical sequence suggested by the plot, so that the listener anticipates the change. But change for no good reason adds nothing but confusion to a script.

One might at some length describe the method by which characters are developed in a radio play, but trial and the thoughtful study of stage plays and radio plays is the best teacher. If

you are interested in this type of program, you should visit the most important radio station in your area and beg of them a few scripts of commercially sponsored radio dramas. Then you will be able to study the style of the professional in writing radio plays.

In my opinion plays are the most effective type of program for presenting health information, and certain surveys have revealed them to be the most popular with radio listeners of all the dramatic forms. A study by Dr. Turner of the Massachusetts Institute of Technology, and two of his associates, revealed that plays, questions-and-answers, talks and dialogues, in the order named, were the types of health broadcasts preferred; but plays are the most difficult to produce of the 4 types of programs. Many radio stations prefer that educators stick to talks, for fear that their more pretentious efforts will fail. For a radio play to succeed, it must be well acted by competent players, carefully rehearsed and produced with all the trimmings of music and sound effects. I would advise no health workers to attempt to produce radio plays unless they have the time and the talented performers necessary to do a good job.

In the production of programs, the staff at any station will guide the beginners and carefully watch over the more experienced. They will tell you the distance from the " mike " to stand, the voice level to assume, how to fade in or out in plays. The sound effects man will usually be on deck if you need him, and all he will require is an extra copy of the script with the sound business marked in it at the right points. If you are producing a play, however, the effects you want to get over, the speed of the production, and the degree of emotion that is to be put into the reading of the lines is up to you. It is wise to have a producer for such a program, either yourself or some other, who is not acting or announcing and is free to listen to the program from the control room and make the changes in accent that mark a well produced play from a sloppy production. It is wise, too, to have a producer for the other types of programs, to keep check on the speed and to help the speakers over their nervousness.

Actors for a radio play are chosen entirely by their voices. Radio station production managers never see their actors while casting a play, they only hear them. A voice does not always suggest the person of its possessor. The little boy you hear on the radio may be a woman of mature years and tremendous size. With experience you can to a degree pick voices without hearing them on the " mike "—at least you can tell generally whether they will be good or bad and the type of voice. But when you hear them over the " mike " you will find that frequently you have been mistaken and the person you had in mind will not do at all. It is therefore wise to cast a play well in advance, with tryouts at the studio.

It is equally important to try out the voices of speakers for the simpler types of radio programs, since 15 minutes of an irritating voice is rather hard on the radio listeners—or would be hard if they would listen. I know it is not always possible to bring a proposed speaker around to the station days in advance and try his voice—and it is even harder to tell him he will not do after he has counted on presenting the talk and told all his friends, and when he may be your superior in your professional field. But remember this, you might just as well have no program as a poor one.

When first picking your speakers, remember that the biggest names among health workers are usually no better known to the radio public than those who are at the bottom of the

ladder of fame in their profession, and those at the bottom usually have more time to work on programs, are more willing to take suggestions, and are more apt to turn out a true, dramatic radio program than a scientific address designed for their peers, or an elementary talk that makes the radio listener feel he is being given crumbs by the mighty sitting around the table of science.

Radio is the most potent medium at our command through which we may reach the people of this country, give them the information we have at hand, and motivate their actions toward a new way of life.

Radio time is available to us, or can be made available for our use when we can show sufficient public interest in our work, or can show unification of health groups sufficient to end the conflict of educational policies and information.

Better radio time will be available when we are able to produce programs of a professional quality, entertaining to and desired by the public. In attempting to reach this last goal, we can do no better than to study the productions of commercial radio sponsors, for they at least know better than we the desires of the public. After all, the public has paid them well.

Do not think that all we need to do is sugar-coat our information. That is begging the issue. If our radio programs fail it will not be because of the public's lack of interest in anything but the froth of human knowledge, but because we are ignorant of the technics of radio production and because we lack imagination.

Domestic Servants and Syphilis

NORTH CAROLINA has enacted a law requiring all domestic servants to be examined for the presence of syphilis and other communicable diseases. A summary of the Act from May, 1937, *Health Bulletin* follows:

Section 1: That hereafter all domestic servants who shall present themselves for employment shall furnish their employer with a certificate from a practising physician or the public health officer of the county in which they reside, certifying that they have been examined within 2 weeks prior to the time of said presentation of said certificate, that they are free from all contagious, infectious, or communicable diseases, and showing the nonexistence of any venereal disease which might be transmitted. Such certificate shall be accompanied by the original report from a laboratory approved by the State Board of Health for making such tests showing that the Wassermann or any other approved tests of this nature are negative. Such tests to have been made within 2 weeks of the time of the presentation of such certificates, and such certificate shall also affirmatively state the nonexistence of tuberculosis in the infectious state.

Section 2: That all domestic servants employed shall be examined at least once each year and as often as the employer may require, and upon examination shall furnish to the employer all of the evidence of the condition of their health as is set out in section one hereof.

Section 3: All laws and clauses of laws in conflict with this Act are hereby repealed.

Section 4: That this Act shall be in full force and effect from and after its ratification.

Points of Interest in a Survey of Maternal Mortality*

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THE number of women who die from causes directly attributed to pregnancy and childbearing is excessive. An unnecessary loss of life continues despite the fact that the leading causes of death (sepsis, hemorrhage, and toxemia) are largely preventable; and there is little evidence of a declining mortality which apparently should follow improved facilities and methods for the care and management of obstetrical cases.

Realizing that a knowledge of the circumstances under which deaths occur is essential to the introduction of measures capable of reducing mortality, the Board of Health and Medical Society of Jefferson County, Alabama, jointly undertook a 5 year study of maternal mortality in an effort to determine what proportion of deaths could be prevented, what persons and conditions were responsible.

This study, covering the years 1931–1935, is based on 39,361 live births, 1,925 stillbirths, and on clinical histories of 329 deaths of which 277 were shown to be maternal. The full report [1] is necessarily detailed and statistical, and we wish here only to generalize on some of its more interesting phases. Possibly this information may prove useful to other communities in which similar conditions prevail.

After the accumulation of data, it first became necessary to establish true mortality rates on the basis of the additional information, and then to assign to the proper parties the responsibility for those deaths judged as preventable.

ERRORS IN MORTALITY RATES

The official maternal mortality rate for the full period of study, based entirely on information obtained from death certificates, was 8.3 per 1,000 live births. The true rate as determined from clinical data was 7.0. Of the several factors which led to error in calculating maternal rates the most glaring were the gross inaccuracies of attending physicians in certifying the cause of death. Physicians have themselves to blame that official rates do not reflect actual conditions, and in this instance were 18 per cent too high for the period of study. Actually, only 70 per cent of all deaths could be properly classified on the basis of information furnished by the death certificates. Mortality rates, already abnormally high, were pyramided by the inclusion of many fatalities not associated with pregnancy. Too often, the physician fills out a death certificate

* Read before the Health Officers Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 23, 1936.

contrary to his best knowledge and judgment. This is unquestionably due to his failure to appreciate the value of such certificates, and as a result he often cares little about accuracy. Instances of wilful misrepresentation of facts, in order to cover up gross errors in judgment or technic, were extremely rare.

RESPONSIBILITY FOR PREVENTABLE DEATHS

Among the maternal deaths 18 per cent were judged to have been non-preventable. These include deaths of women who sought medical care without considerable delay, and who were promptly treated in the accepted manner. Two hundred and eighteen, or 78 per cent, of the fatalities were judged by a committee of obstetricians to have been preventable. For these, responsibility was placed as follows:

Patient	50%
Physician	40%
Midwife	3%
Divided, or undetermined	7%

The 108 cases in which women were responsible for their own death represent, in their order of importance: (1) failure to obtain medical care at the time of abortion or delivery, (2) failure to obtain adequate prenatal care, and (3) self-induced abortion. The physician is practically helpless in such instances, for the patients, disregarding signs of impending danger, fail to seek medical care until seriously abnormal. Under such circumstances it is not surprising to learn that only 18.5 per cent of all fatal cases had adequate prenatal care as judged by the minimum standards adopted by the U. S. Children's Bureau.

Abortions accounted for one-fourth of all deaths. The fact that 98 per cent of these cases were desperately ill from sepsis or hemorrhage when a physician was first called is fair evidence that many were the result of illegally performed operations. Such cases represent social problems primarily, and medical problems only secondarily. The frequency with which self-induced and criminal abortions are performed is not so much a result of illegitimate pregnancies as it is a direct corollary of economic and social conditions among white married women.

Chronic diseases often complicate pregnancy, and the frequency with which they appear on death certificates, as joint causes of death, emphasizes the importance of a thorough medical examination before pregnancy is undertaken.

Physicians were judged responsible for a death when it was shown that they exercised neither the degree of learning and skill, nor the usual care and diligence in the performance of their duties, that would be expected of a practitioner of modern obstetric science. On this basis physicians were judged responsible for 40 per cent of all preventable deaths. Errors in judgment and technic represent largely a failure to recognize and treat complications promptly; wrong choice of an operation; unnecessary operative interference; operating without proper safeguards such as transfusion in a case of bleeding from placenta praevia; failure to maintain asepsis; and failure of the doctor to recognize his own limitations in not obtaining consultation, or in performing an operation for which his training and experience did not qualify him. In a few instances gross neglect on the part of the physician resulted in death of the patient.

It would be interesting, if possible, to determine what individual physicians, or what class of physicians were largely responsible. Data obtained on 9 individual physicians with large obstetrical practices are shown in Table I, and appear reliably to represent mor-

tality trends. In calculating these rates the physicians were not charged with all maternal deaths occurring in their practices, but only those for which they were judged responsible.

TABLE I

The Practice of Certain Individuals

	Live Births			*Maternal Mortality Rate* *	*Stillbirth Rate* *
	Number	*Per cent Negro*	*Per cent Hosp. Del.*		
3 Obstetricians	1,718	1	85.0	0.6	26.2
3 Practitioners, White	833	28	6.2	3.6	21.6
3 Practitioners, Negro	1,431	100	0.4	2.8	57.3
All Midwives	1,372	82	0.0	4.4	61.2

* Deaths per 1,000 live births

It will be noted that 3 obstetricians had far fewer deaths of mothers than did 3 general practitioners though the latter maintained a slightly lower stillbirth rate. Three Negro practitioners lost fewer mothers than the white practitioners though their stillbirth rate was considerably higher, as would be expected in Negro practice. A white general practitioner with the largest obstetrical Negro practice is not included in the above table. He maintained a maternal mortality rate equal to that for all midwives while his stillbirth rate was 50 per cent higher than that for midwife deliveries.

With the exceptions noted, and excepting the practice in hospitals with closed staffs, practically all other deaths occurred in the practice of physicians who do very little obstetrics. The inability of these physicians to deal successfully with abnormal cases because of their very limited experience accounts in a large measure for the remaining deaths.

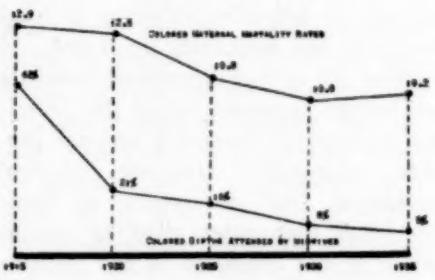
Midwifery, fortunately, is no great problem to Jefferson County for the practice is largely emergency in character, and is confined almost entirely to Negroes. The general education and mental ability of midwives are so low as to constitute a grave hazard for the patients they attend. Their practice will continue until some way is found to bring medical service to the remote communities and the poor. That the elimination of midwifery has brought surprisingly little improvement in colored mortality rates is shown in Figure I. This indicates that, even with the extension of medical service to the vast majority of colored women at the time of delivery, the problem of maternal mortality among Negroes has in no way been solved.

Medical care given to colored patients is inferior to that for the white and this has contributed to a higher death rate. Errors in judgment and technic, and neglect on the part of the attending physician were 50 per cent more frequent among the colored mothers.

NEGRO MORTALITY

An analysis of maternal mortality rates by color shows a Negro rate 78

FIGURE I



per cent higher than the white. In general, the same factors which produce a high white rate also operate, but to a much greater extent, to produce a higher Negro rate. We find that the frequency with which deaths occur among Negro women is higher than the white by 80 per cent for sepsis, 95 per cent for hemorrhage, 95 per cent for toxemia, and 32 per cent for all other maternal causes. The frequency with which intercurrent diseases occur, and serious preëxisting diseases are found, are also greater by 32 per cent among the colored.

When these rates are further itemized according to the various preventable factors we find that the colored rates exceed the white in practically every instance. Among the Negroes, ignorance was the more frequent preventable factor by 42 per cent, failure to obtain suitable delivery or abortion care by 170 per cent, and failure to obtain adequate prenatal care by 300 per cent. On the other hand, self-induced abortion, as a cause of death, was 133 per cent more frequent among the white.

HOSPITAL PRACTICES

Within recent years medical literature has focused attention upon the comparative safety of deliveries in the home and in the hospital. The issue has merit. In expert hands and amid proper hospital surroundings the risks attached to childbirth are materially reduced. Despite this fact, our maternal death rates have not been materially lessened, although the percentage of deliveries occurring in local hospitals has noticeably increased.

Since all of our important hospitals are on the approved list of the American College of Surgeons, and all provide reasonably adequate physical equipment, the explanation of these continued high rates must be sought either in the condition of the patients admitted, or in the ability of medical attendants in hospital practice.

The per cent of abnormal obstetrical cases admitted to hospitals is high (72 per cent as compared to 39 per cent for home deliveries), though with an increasing percentage of hospital deliveries there is reason to believe that the relative number of abnormals admitted is decreasing. In short, it appears that the responsibility rests upon the medical attendant, and the failure of mortality rates to decline is in no small part a reflection upon the obstetrical skill and judgment of the hospital attendant.

The safety of the patient, of course, rests primarily upon the ability of the attending physician, regardless of the place of delivery; and in the hands of a competent physician any abnormal case can always receive better care and experience less danger in a hospital than in the home. It is equally apparent, however, that in the hands of the incompetent the danger is often greater in hospital practice because of the opportunities afforded the attendant to perform operations for which his training and experience do not qualify him.

Until hospital authorities provide adequate measures to elevate obstetrics as practised in their institutions to the level of generally accepted standards, increased hospitalization of obstetrical cases will not materially reduce the number of fatalities. Regardless of whether institutions maintain an "open" or "closed" staff their failure to supervise obstetrical practice deserves criticism. They must know the character of work done by their visiting staff of physicians, must require adequate consultation in difficult cases, and must provide ways and means for residents and internes to receive adequate instruction and practical experience.

Considerable doubt has been ex-

pressed by physicians concerning the reliability of much of the published data regarding hospital statistics, and rightfully so. Death rates cannot be calculated merely from information obtained from death and birth certificates. Complete clinical histories of all fatalities are necessary before one can judge whether the error leading to death occurred in the hospital, or through some fault of the physician or the patient before admission. In the discussions that follow hospitals have been charged only for those deaths in which an error in judgment or technic occurred after admission. Decisions were based on clinical histories, and in most instances the circumstances were so clear as to leave little difficulty in identifying the responsible party.

Of 87 preventable deaths for which physicians were held responsible, the break or error leading to death occurred in hospitals in 50, or 57 per cent, as follows:

Neglect at or following delivery	3
Errors in technic	15
Errors in judgment	29
Errors in both technic and judgment	3

In some instances there was carelessness or neglect on the part of internes who, without making postpartum observations, allowed cases of hemorrhage to die without attention; in other instances inexperienced internes, without supervision, performed operative obstetrics for which they were not qualified; in still other instances attending physicians were entirely responsible through failure to exercise proper judgment and skill.

TABLE II

Incidence of Obstetrical Operations in Various Hospitals *

	Caesarean Section	*Version Extraction*	*Forceps*	*Total*
	%	%	%	%
Highest	8.4	27.0	33.9	65.6
Lowest	0.9	3.5	4.7	11.2
Average (6 hosp.)	2.4	11.0	17.9	32.1

* Based on 15,505, or 93 per cent of all hospital live births.

OPERATIONS

The incidence of obstetrical operations performed in all hospitals during the period of study has varied only slightly from an average of 310 per 1,000 live births. The incidence among various institutions, however, differed considerably, as shown in Table II.

The incidence of deaths for which hospitals were judged responsible varied from 0 to 0.42 per cent, while strictly operative deaths varied from 0 to 0.21 per cent. One hospital had the highest incidence of total hospital deaths, operative deaths, and sepsis deaths while another hospital had the lowest incidence of all 3.

As regards caesarean sections the following conclusions are justified: (1) caesarean section is often done for no valid reason; (2) definite contraindications for operation are often disregarded; (3) a reasonable degree of technical skill is sometimes not possessed by the operator; (4) adequate consultation is often neglected; (5) proper pre-operative preparation is occasionally neglected; (6) poor surgical judgment is occasionally shown during the actual operation. Death rates for various operations are as follows:

Caesarean section	2.1 per cent
Version extraction	0.4 per cent

These rates are for operations performed in hospitals and include only those deaths for which the operation itself was judged responsible for the death. They represent cases in which the operation was improperly performed or in which the wrong operation was selected. Corresponding rates for home deliveries are not available.

However, a total of 8 per cent of all maternal deaths were directly attributed to operations improperly performed.

One result of the high frequency of operations in hospital practice is to increase sepsis rates which at best are as high as those for home deliveries. Table III shows the sepsis rates for both home and hospital deliveries as well as many other factors which influence the development of sepsis.

TABLE III

Practices at Delivery Which Influence the Development of Sepsis *

	Hospital Deliveries	Home Deliveries or Deliveries Attempted at Home
Sepsis mortality rate (per 1,000 live births) †	0.90	0.84
	Per cent	*Per cent*
Patient abnormal when first seen (but not septic)	72	39
No physician or nurse to assist at delivery	0	75
No preparation of patient for delivery (neither shaved, nor sterile goods used)	2	67
Operative deliveries	74	41
Membranes ruptured artificially	19	8
Two or more vaginal examinations made	14	18
Rubber gloves not used	0	7
Pituitrin used in 1st and 2nd stage	2	7

* Based on 160 deliveries attended only by physicians

† Based on 16,633 home and 22,728 hospital live births, and including only those deaths from sepsis for which physicians were judged responsible

REMARKS

Upon the physician rests the greatest burden of responsibility for reducing the incidence of preventable deaths in obstetrics, yet a reasonable amount of responsibility looking toward the prevention of deaths from maternal causes is an inescapable and mandatory duty of the general public, and all agencies interested in health and welfare.

Ultimately the accomplishments attained will result largely from a process of "push-and-pull" between the medical profession and the public—the profession offering expert care, and the public demanding that it be given.

The place of public health (whether federal, state, or local) in this program is definite and important, and includes (1) full coöperation and encouragement to the medical profession, (2) wide and constant educational programs and (3) as finances permit, assistance to indigents by furnishing medical care.

Educational programs directed to the individual case through the public health nurse are more important than sporadic efforts directed through the press, or to interested welfare groups. Women should know what constitutes adequate prenatal and delivery service and should be able to discriminate between the physician performing obstetrics "by chance" and the one performing such duties "by science." All clinics and hospitals rendering maternal services must be directly supervised by competent and well seasoned obstetricians. Opportunities for the teaching of general practitioners in these centers should be fully utilized. The services offered must go beyond the administration of prenatal care and must include supervision, assistance, and consultation in actual deliveries. Our local problem cannot be touched by providing prenatal care alone, for in our studies 67 per cent of all abnormalities causing death developed with the onset of labor or subsequent to it.

Finally, whatever efforts are directed toward the reduction of mortality, faith of the public in the integrity of the medical profession must be carefully guarded and fully maintained.

REFERENCE

1. *Maternal Mortality in Birmingham and Jefferson County, Ala.*, Joint report of Jefferson County Medical Society and Jefferson County Board of Health. June 1, 1936.

The Need of Uniformity of Conditions for Counting Plates

With a Suggestion for a Standard Colony Counter

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IN the quest for the sources of error to which bacteriological plate counts of milk, water, and other materials are subject, comparatively little attention has been directed to the need of *standardization* of the conditions under which the counting of the colonies on the plates is performed. It must be evident, however, that uniform counts of a plate cannot be expected if a variety of types of illumination and a diversity of magnifications are employed.

Perhaps the principal reason for this unconcern has been the assumption that variations in conditions of counting give rise to variations in counts which are only of minor importance. That *gross* discrepancies between counts of the same plate may result from the use of different types of illumination of the colonies, that even well designed counting devices which employ different methods of lighting may yield very discordant counts, is apparently not generally recognized. Two recent practical experiences of the authors, which doubtless are similar to those of others who have had occasion to compare counting devices, are suggestive. In one instance the bacteriologist of a water purification plant questioned the accuracy of very high plate counts reported by the Provincial Laboratory, contending that his own counts were all very low. Examination of his plates by means of the counter to be described readily revealed the presence of large numbers of colonies which he had not detected. In the other instance a dairy laboratory reported a series of counts from duplicate milk samples which were consistently lower than those obtained by the Provincial Laboratory; the dairy laboratory was using a well known type of counter which employs only reflected light. When this counter was compared with the other, it was found that many colonies, and some of considerable size, which were plainly visible by the combination of transmitted and reflected light of one counting device, disappeared entirely when viewed by the reflected light alone of the other. In each of the instances described, the sole cause of the discordant results was a difference in the conditions of illumination of the plates.

Different magnifications also may be expected to yield different counts when very small colonies are present. For many years past *Standard Methods of Water Analysis* has specified, for plate counting, the use of a lens magnifying

approximately 2½ diameters. *Standard Methods of Milk Analysis* recommended, but did not specify, the same lens until 1934 when, in its Sixth Edition, a lens magnifying "at least 1½ diameters" was recommended. This permission of the use of a lower magnification very properly recognizes the present-day preference of laboratory workers for the ordinary reading glass of wide field and of easy manipulation. In the interests of economy and convenience, as well as of uniformity of performance, it is advisable that one specified lens of low magnification be substituted for the variety of lenses now in use. An auxiliary lens of considerably higher power is required occasionally to distinguish between colonies and extraneous material; but the primary magnification, which really determines the order of the count, should evidently be standardized.

For the purpose of developing an extremely simple counting device which would offer, if not the best, at least very satisfactory conditions of illumination, magnification, and convenience, and which might serve as a suggestion for an initial effort to establish uniformity of counting conditions, the authors undertook an extensive study of the essentials of a practical colony counter, with particular regard to its illumination. A number of counters were made up and compared; both routine water and routine milk plates served as material for examination.

The indications furnished by this study were then incorporated in a design for a counter, three of which were made and used for routine counting for several months and found satisfactory. This design was then submitted to the Referee * for Methods of Counting Bacteria in Dairy Products (Committee on Standard Methods) who had several of the counters constructed and distributed to various laboratories for trial.

Following the receipt of favorable reports concerning the utility of the apparatus, the aid of a manufacturer † was enlisted for the construction and distribution of the device at a reasonable price. Both the Referee and the manufacturer contributed further improvements to the design, and the final result is the "Quebec Colony Counter" described below. No marked originality is claimed for this counter, but it is believed that it combines the essential features which make for constant magnification and illumination, for the convenience and comfort of the operator, and for accuracy of counts.

MAGNIFICATION AND ILLUMINATION

Magnification—The lens chosen for the counter is an ordinary 4½" reading glass magnifying about 1½ diameters. As this lens provides a large field of vision which includes the whole plate (100 mm.), its use does not necessitate continual readjustment of the position of the operator.

It is admitted that a magnification greater than 1½ diameters would be somewhat preferable, but pending development of a low-cost lens which, while retaining the advantage of a wide field, will furnish greater magnification, the type chosen should suffice.

Illumination—Constant lighting conditions are obtainable only with artificial illumination; and since electric lighting, the obvious choice, necessitates the use of a box-form of counting device, a variety of frames, types of lamps, and mirrors to reflect the light were included in numerous designs of such counters, in order to determine the most satisfactory method of illumination. From this study certain conclusions were apparent:

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† Spencer Lens Company, Buffalo, N. Y.

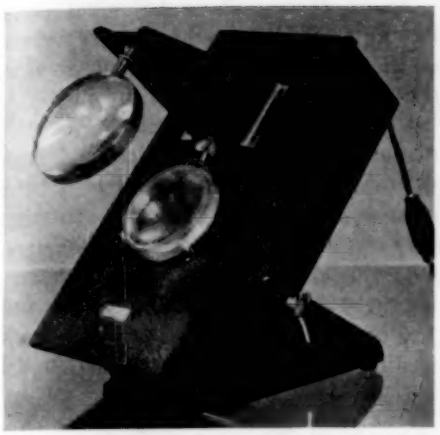

FIGURE I—Quebec Colony Counter

1. Reflected light alone is insufficient. Certain types of colony that are quite readily visible by transmitted light are invisible by reflected light.

2. The combination of transmitted and reflected light provided by placing the source of illumination behind, and at one side of the plate is undoubtedly the best.

3. No direct rays or glare from the filament or lamp bulb must be permitted to reach the eyes of the operator.

4. Lamps placed on 3 or 4 sides of the plate, however disposed with regard to their distance from the plate, or with reference to the plane of the plate, fail to provide satisfactory illumination.

5. Two lamps, disposed at opposite sides of the plate, give the best illumination. A mirror may be substituted for one of these lamps with practically identical results. (It is interesting to observe that this disposition of a light source at one side and a mirror at the other is the type of illumination recommended by Graf [1] in a counter described many years ago. In this counter the mirror was adjustable, and the background was shielded from direct rays of the lamp.)

It remained—for the purpose of standardization of the illumination—to fix the exact positions of the light source and of the mirror, to specify the dimensions of the frame, and to specify the intensity of the light and the character of the reflecting surfaces of the box interior.

The positions of the light source and the mirror are largely determined by the relative positions of the window and the magnifier. The direct rays and glare from the lamp and mirror passing through the plate, must barely clear the outer circumference of the magnifier, if the maximum effect of the light is to be secured and if intense light is to be kept from the eyes of the operator. The exact arrangement was decided by experiment.

The simplest and smallest box, or frame, compatible with the determined positions of the lamp and mirror, was chosen, in order to facilitate home construction of the apparatus and to reduce the bench space occupied by it to a minimum. The improvement effected by shielding the bottom surface (background) from direct light rays did not appear to compensate for the additional construction and the greater dimensions of frame necessitated.

The ordinary 60 watt frosted Mazda lamp was found to furnish ample light. A dull black coating for the interior surface of the box opposite the plate, and aluminum paint for the other in-

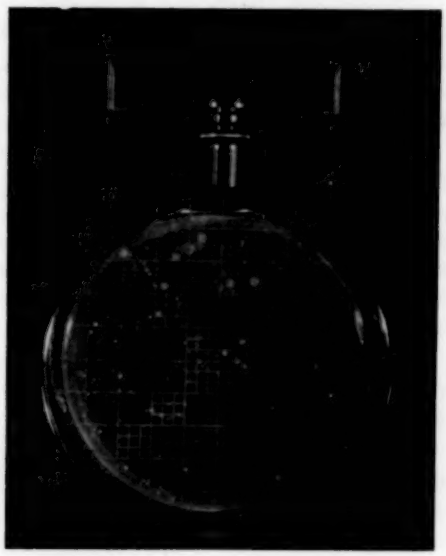

FIGURE II—Quebec Colony Counter. Plate in Position for Counting.

terior surfaces complete the conditions desired.

With the illumination described, an effect similar to that provided by a darkfield condenser equipment is obtained, and the colonies stand out sharply against the dark background. With both light source and mirror fixed, constant illumination of every plate counted is insured.

ESSENTIAL SPECIFICATIONS OF COUNTER

Frame or Box—Inside dimensions: Length, top, 15¼″; length, bottom, 13½″; width, 7¼″; depth, 4¼″. The end which supports the lamp socket forms right angles with top and bottom; that which supports the mirror forms an angle of 113° with the bottom.

The interior bottom surface is painted dull black, all other interior surfaces with aluminum paint.

The window which permits illumination of the plate is 4″ in diameter and is placed midway between the sides of the frame. The lower circumference of the opening is 4¼″ from that end of the frame which supports the mirror.

The top of the frame is hinged to facilitate dusting of mirror and reverse side of ruled glass plate; and both ends are provided with openings to permit ventilation.

Light—An ordinary 60 W—120 V Mazda lamp (bulb: standard lighting A 21) is centered midway between top and bottom and between the sides in such a manner that the filament is 4¼″ from the end of the frame which supports the lamp socket.

Mirror—A plain mirror 4¼″ x 5½″ rests on the interior surface of the opposite end of the frame.

Magnifier—A reading glass, 4½″ in diameter, magnifying approximately 1½ diameters, is mounted in such a manner that it may readily be adjusted to suit the vision of the operator.

Ruled Plate—The ruled glass plate is supported inside the upper surface of the frame and flush with it, so that the Petri dish is supported by it.

Certain features (included in the manufactured article) which add considerably to the convenience of the counter are a device to permit centering of Petri dishes of different diameters, an adjustable mount to permit centering (or removal) of the magnifier, and a hinged support to allow adjustment of the frame to any position from the horizontal to the vertical.

ADVANTAGES OF THE COUNTER

The principal advantages of the counting-device described are the following:

1. Constant illumination and magnification are provided.
2. The counter can be used in any position, from the horizontal to the vertical; the operator may assume an upright, comfortable posture when counting plates.
3. The magnifier in its fixed position permits a view, in focus, of the whole plate; as a consequence, eye strain is eliminated.
4. As no direct rays of light can pass through the magnifier, the operator is protected from disagreeable glare.
5. The working distance between the lens and the Petri dish is so great (about 6″) that there is ample space for insertion of an auxiliary occasional lens, or for manipulation of a needle if colonies are to be fished.
6. Wolffhuegel, Jeffer, or Stewart ruled plates may be used interchangeably with the apparatus.

REFERENCE

1. Graf, A. V. A New Bacteria Counter. *J. Am. Water Works Assoc.*, 21:1531–32, 1929.

NOTE: The authors express their very grateful acknowledgment to A. H. Robertson, Referee for Methods of Counting Bacteria in Dairy Products, Committee on Standard Methods; to H. N. Ott, Spencer Lens Company; and to the many laboratory workers who have tried out the device described, for their kindly interest and coöperation in its development.

The Laboratory Diagnosis of Amebiasis*

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THE laboratory diagnosis of amebic infection is in a very unsatisfactory state at present, not because there is anything inherently lacking in the procedures available, but because of the universal lack of training among laboratory personnel for this type of work.

This, together with an equally widespread lack of understanding and appreciation of the situation on the part of everybody concerned, is productive of such a high percentage of unreliable reports, and their blind acceptance, that the situation is worse by far than if no laboratory tests at all were made in many, perhaps, most cases.

The above statement is made advisedly, but lest it appear to be overdrawn, a few reasons for pessimism will be cited. A doctor from a town of about 20,000 in discussing a paper at the County Medical Society, related the recent occurrence in his practice of some 20 cases of amebic dysentery among children. His diagnosis was based on the reports from a commercial clinical laboratory run by a man of many years' experience and possessing the confidence of the medical profession in his community. Those who are familiar with the epidemiology of amebic dysentery will not need any laboratory evidence to convince them of the erroneous nature of the reports of this laboratory in so far as amebic dysentery is concerned.

A certain large hospital, the laboratory of which is presided over by a competent general pathologist, has on the laboratory staff a "parasitologist" of many years' practical experience who has twice failed to pass the state examinations.

A physician in a smaller city reported several cases of amebic dysentery diagnosed by a local laboratory. Investigation by the State Department disclosed bacillary dysentery and not amebic.

Such occurrences must be common everywhere; indeed, the opinion that they are the rule and not the exception is inescapable in the light of what follows.

In California state examinations for certificates of proficiency in parasitology, the number of applicants during the past 3 years was 214, of whom 79, or 37 per cent, passed and 63 per cent failed. This in itself may seem disturbing since the examinations are as simple, fair, and practical as it is possible to make them, consisting as they do principally of the identification of material under the microscope.

Furthermore, these applicants come from laboratories, often with years of practical experience behind them; some have had courses in schools for technicians and some are college graduates with a major in zoölogy and courses in protozoölogy. All are confident of their ability to recognize and identify in-

* Read at a Joint Session of the Laboratory, Food and Nutrition, and Public Health Engineering Sections of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 23, 1936.

testinal protozoa and to be generally competent in a clinical diagnostic laboratory. But when the training and experience of the applicants is inquired into, the outlook for a dependable supply of technicians in this field is alarmingly uncertain.

An analysis of our data with respect to the previous training and experience of these applicants shows that there is only one way to become proficient and that is by a direct course of training under a competent protozoölogist, and this course is preferably an intensive one without admixture with other activities during its continuance.

Of the 214 persons referred to, 133 were college graduates and 81 were not. Of the college graduates, 22 had no other advantage and of these only 2, 9 per cent, passed, showing that college alone, even with academic courses in protozoölogy is not sufficient. Of the 81 non-college people, those who had only practical experience numbered 39, of whom only 2, 5 per cent, passed, showing that college alone is a little better than experience alone, and that experience alone is worth practically nothing.

A combination of the two is, however, worth a little more. In this group of 34 people, 14 per cent passed. Those who had some sort of technicians' course such as in private training schools or in a teaching hospital laboratory, or a university extension course designed for technicians, plus practical experience, and in most instances also a college degree, scored 36 per cent of successes. The best group of all was made up of those who had the advantage of an intensive course of the type mentioned, in addition to practical experience. In this group there were 39, of whom only 2 failed.

Needless to say, there has been disappointment and criticism of the examinations. One of the commonest is that the worker is familiar with and is competent to examine fresh preparations but is not familiar with fixed and hematoxylin stained slides as used in the examination. Our answer to this will be found in the writings of the leaders in this field, and quotations from James and from Dobell will serve as examples. James says:

> Personally, in doubtful cases, I no longer accept my own findings based only on fresh material, and rely for the final determinations exclusively on wet, fixed and stained preparations. . . . This determination can be made with a very high degree of probability in the wet fixed or permanent preparation by anyone capable of reliable clinical work. In fresh material, it cannot be made at all except by those with long and special training and thoroughly familiar with the elements of microscopy. Yet, in more than one medical center, untrained technicians are finding histolytica in a high percentage of fresh stool examinations and clinicians are attributing a vast variety of infirmities from Hodgkin's disease to chronic arthritis to infestation with this parasite.

Dobell says (concerning fresh preparations):

> The errors committed by an examiner with little or no previous experience are such as I could not have believed possible if I had not actually encountered them.

In this statement, Dobell is not referring to workers without any training at all, but is writing of his experience in teaching the identification of the ameba of man to a selected group of 37 workers accustomed to the use of the microscope and with previous laboratory training. At the end of 5 weeks, there were 5 of these workers classified as having attained considerable proficiency.

The necessity of good optical equipment cannot be stressed too strongly. Microscopes and lighting such as are frequently found in laboratories result in confusion and error in diagnosis.

To be proficient in the recognition of intestinal parasites, one needs famili-

arity with type forms which are used as patterns and the advantage of having spent much time in reading routine slides under proper guidance. The recognition of type forms however, is a simple matter as compared to the recognition of degenerate or atypical organisms, cellular débris, etc., or coprozoic forms. One needs to know what is not, as well as what is *E. histolytica*.

The temptation to fit a name to everything one sees is very strong, but no matter how fresh the specimens or how experienced the worker, there are always organisms which for one reason or another are impossible to identify definitely. It is better to say "I don't know," than to hazard a guess and be wrong. A second or third specimen might clear up the doubt, or one may have to wait until the series is complete before it is possible to identify the organism certainly. It may even be necessary to have a second series before deciding.

It is generally recognized that a negative result on the first specimen is not conclusive evidence of absence of infection, since these organisms appear in the stools in irregular cycles. The number of specimens to be examined varies with different workers; but many of them have more or less agreed upon 6 consecutive daily specimens as a reasonable number. However, according to our statistics and those of Wenrich, who recently published a survey on 1,000 freshmen at the University of Pennsylvania, 10 daily specimens would be a more conclusive number.

The selection of a method of examination for intestinal parasites has been and still is a much debated question. The various workers in the field have each put forward arguments for a particular method, but it finally simmers down to the fact that there are two methods generally accepted as more or less standard: (a) examination of the fresh material with saline and iodine stain, and (b) the wet-fixed iron hematoxylin-stained method. In the comparison of the reliability of the fresh-iodine-eosin method and the wet-fixed-hematoxylin-stained preparation, there have been some interesting figures given by several workers.

James estimates his percentage of error with fresh preparations as 25; Wenrich, Arnett, and Stabbler as 17. Inasmuch as these men have had great experience in both methods, it would seem that their figures are highly significant. Since the identification of the various intestinal protozoa depends upon the recognition of the different cytological structures, the method of choice should be that one which most clearly presents the structures.

There is no better general cytological stain than Heidenhain's iron-hematoxylin. The greatest argument against it has been the time consumed in preparation. This has been considerably reduced by use of the hot method. In emergencies, a slide for examination can be prepared and read in 2 hours. The dangers of a fresh examination are mainly these: First, in the saline preparation one must contend with both temperature and pH changes. The identification of *E. histolytica* and *E. coli* for years depended on their characteristic movement and pseudopod formation. One forms explosive hyaline pseudopods, the other sluggish and granular. It is now known that it is possible to change the appearance of the pseudopods from hyaline to granular or *vice versa* by altering the pH of the medium. Changes in temperature materially affect the movement. Second, the ingestion of red blood cells is not always a safe criterion for identifying *E. histolytica* inasmuch as *E. coli* may also show this phenomenon.

The finding and identification of cysts in iodine-eosin preparations is

likely to fail because the reaction of the glycogen vacuole and penetration of the iodine into the nuclei is variable. For instance, the staining of the glycogen vacuole in Iodameba has always been given as an unfailing rule for the identification of this form, but we now find that the glycogen vacuole does not always pick up the iodine. The penetration of the iodine into the vacuoles of *E. histolytica* and *E. coli* is sometimes very confusing in this respect. Again, iodine-eosin fails by reason of the fact that identification by counting nuclei is unsafe, as often the per cent of 4 nucleate coli outnumbers the 8 nucleate forms in a specimen, and very occasionally one may find an 8 nucleate histolytica, large race. Another cause for failure of iodine-eosin is that the differentiation of *E. histolytica*, small race, from *E. nana* is practically impossible and when it is there in small numbers, it is easily overlooked.

The amount of material searched on one fixed-stained preparation is about 4 times as much as one sees on one wet mount, and the advantage of being able to pin the object down and take a good look at it not once but several times, more than offsets the time saved in a quickly prepared iodine-eosin preparation.

The need for absolutely fresh specimens in order that the diagnosis may be based on the finding of motile forms is not so acute as generally supposed. While the use of stale specimens is not to be recommended, distance from the laboratory is not an insuperable barrier to good work. Specimens reach us from distances of 300 to 400 miles and the finding of motile amebae in unformed stools 36 to 72 hours old is not uncommon using wet-fixed-stained preparations.

The use of cathartics enhances the chances of finding motile forms but they must be used with caution. Epsom salts has as violent an effect on those organisms as on the endothelium of the intestinal tract and should be avoided. If one must be used, a milder laxative should be chosen, such as effervescent sodium phosphate, bile salts or milk of magnesia. Specimens taken after barium are of no value.

The best results in feces examinations are obtained when the direction of the work is in the hands of one whose interests are not exclusively in the field of protozoölogy or of bacteriology, but who is familiar with both; particularly is this necessary in epidemiological investigations. The laboratory must be of real aid to the physician or health officer requesting the investigations. To do this effectively, it must have full information concerning the patient, or, in the case of epidemiological investigations, the circumstances calling for the investigation. It must be fully informed as to the clinical and epidemiological aspects of both amebic and bacillary infections and the influence of one upon the other. For instance, a bacillary infection or even a gastrointestinal attack from the ingestion of raw sewage without the occurrence of specific, recognizable infection is capable of stirring up a latent amebic infestation and giving the apparent picture of active amebiasis.

The widespread existence of cyst carriers and the common occurrence of intestinal disturbances due to a rapidly increasing list of bacterial causes accentuates the need for close coöperation between the laboratory and the field to the end that a more intelligent study in all situations may be realized. Appreciation of the pitfalls in diagnosis and in epidemiological investigations is not sufficiently common among those causing examinations to be made, to relieve the laboratory director of a very definite obligation as a competent adviser.

The Supervising Nurse*

J. ROSSLYN EARP, DR.P.H., F.A.P.H.A.
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UNTIL a year ago I had supposed that there was no argument as to the value of the supervising nurse. In New Mexico she had been the chief inspiration and motive force of a successful campaign to introduce public health nurses to the state. It was something of a shock to discover at a meeting in Washington a group of state health officers who believe emphatically that there is no place for supervising nurses in a state administration.

The essential argument of the opposition, if I properly understood the opposition, is that the appointment of a supervisor duplicates authority. It is said to require of the nurse that she serve two masters with the inevitable result that either she will hate the one and love the other or else she will hold to one and despise the other. She cannot serve the health officer and the supervising nurse.

No doubt it reflects great credit upon the tact of New Mexico's supervising nurses that I had worked for 5 years with them without ever becoming conscious of the possibility that our nurses might be placed in this embarrassing position. But since the possibility has been drawn to my attention, and since moreover supervision in this state has been extended to include regional supervisors, I have begun to see whence the fear of divided authority may arise.

Let me say at once that if I believed that the position of supervising nurse really did infringe upon the authority of the public health administrator I should go over bag and baggage into the ranks of the opposition. However, I have discussed this matter with several leaders of the profession of public health nursing and I have never found one of them who did not promptly and whole-heartedly agree that the health officer is under all circumstances the sole administrative authority. That is the first principle which I ask all of you to accept.

When that is accepted I believe I hear some voices in the opposition saying: igitur, there is no excuse left for the position of supervising nurse. This brings me to the second principle which I wish all of you to accept, namely, that there is a definite, distinct, and honorable profession of public health nursing.

A great many men who have been trained in the profession of medicine have received with their training a conviction that the nurse is no more than the hand-maid of the physician. She performs no duties which he does not dictate, she knows no secrets of technic which he is unable to teach her. Gentlemen, there were medical officers in the Crimea before Florence Nightingale left England. I am disposed to believe that we were trained to underestimate the professional independence of nurses in our young days. Whether that be so or not I am quite sure that public health nursing is a profession *sui generis*. Our leading universities give postgraduate courses

* Read before the District Health Officers in New Mexico, at Santa Fe, on January 21, 1937.

and issue certificates in this specialized field. I have never taken such a course. I hold no such certificate. I do not believe that I am admitting incompetence when I express my willingness to accept advice from—even to seek the counsel of—the public health nurse.

This does not mean that the public health nurse invades the field of administration, any more than the sanitary engineer invades the field of administration when he advises me that chlorination alone will be adequate for this city's water supply but that yonder city should install a rapid sand filter.

I do not deny that in actual fact the public health nurse may have trespassed. Two imperfections in our own field of administration have served to lure her into the assumption of functions which do not belong to her. These are (1) the part-time health officer, and (2) disagreement among ourselves on what are acceptable administrative policies.

Many public health nurses have hitherto been obliged to carry on their work in counties that either had no health officer * at all or that were under the direction of a part-time health officer with no special training in public health work. Under these circumstances she was compelled to assume much administrative responsibility. Often the only guidance she could get in administrative matters came to her from the state health department through the supervising nurse. As public health is now organized in New Mexico such trespass is quite unwarranted but old habits cannot be broken in a day.

While it is easy to say that the supervising nurse limits her instruction to professional technic and follows in every detail the administrative policy of the health officer, yet in practice the supervising nurse who cannot know by heart all the details of the health officer's policy may unintentionally violate those policies in giving what she believes to be purely professional instruction. Thus she may instruct the nurse in the technic of venepuncture. The nurse may reason that she would not receive this instruction unless she were intended to use it; and therefore she will proceed to take samples of blood from pregnant women who are unable to consult a doctor. But suppose it is contrary to the health officer's policy for any public health nurse to draw blood from a vein?

Or again the supervisor may describe a method for interesting lay groups in the nurse's program. This is her proper function unless it happens that lay advisory committees are anathema to the administrative authority.

It is just this type of administrative interference which in my own experience has caused most misunderstanding. It can be avoided by good will and the full sharing of policies by the health officer with the supervising nurse; or, as I have suggested above, by the health officers agreeing upon standard policies which each of them will accept. There is such a thing as premature standardization and also such a thing as excessive individualism.

The supervising nurse has an accepted place in the organization both of the U. S. Public Health Service and of the Children's Bureau. Her services were recommended as essential to New Mexico by Dr. Carl Buck, Field Director of the American Public Health Association. It ought to be possible for her to assist rather than to interfere with the administrator. That is the function which the official health agencies have designed for her and the function which I am convinced she most earnestly desires to perform.

* New Mexico has had health officers either full-time or part-time in every county since 1919 but many of our public health nurses gained their experience in other states.

Epidemic Bacillary Dysentery in a Hospital for the Insane

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EPIDEMICS of bacillary dysentery in jails, asylums, and similar institutions are always to be dreaded. This is particularly true of hospitals for the insane because of the difficulty in early recognition in psychotic persons, in maintaining suitable isolation, and in enforcing measures which will prevent the spread of the disease.

Two small outbreaks of bacillary dysentery occurred within approximately 1 month of each other in a hospital for the insane. The general sanitation of the institution was of high order and especially was this true of the kitchen.

OUTBREAK AMONG THE FEMALE PATIENTS

On September 9, 1936, an old negro woman, who was not only psychotic but whose speech was limited to a broken French patois, became ill. Her age was 101. She told the physician, "Je suis malade," but no definite information was obtained until diarrhea was discovered by the maids. She appeared somewhat prostrated, temperature 100.8° by rectum, pulse 88, respiration 24. The oral mucous membranes were dry, the tongue coated, the chest clear; no abdominal tenderness, but some gurgling on pressure over the cecum; appetite impaired. As inmates of this type frequently have diarrhea of 2 or 3 days' duration, usually ascribed to their faulty habits of eating, no particular attention was paid to her condition though she was given bismuth by mouth. Examination of the stools was unsatisfactory because of the bismuth in the feces. The nature of her attack was not appreciated until some days later, when purulent exudate was found although cultures were negative.

September 14, 3 other women were reported to have diarrhea. The stools showed the microscopic picture of bacillary dysentery: pus, macrophages and red blood corpuscles. Enteric precautions were instituted and a light, high digestive diet was prescribed. The first cultures were negative, but there was a considerable interval between passage of the stools and making the cultures.

September 17, 2 additional cases occurred. The feces showed the characteristic picture of bacillary dysentery and cultures were positive for *Shigella paradysenteriae* (Flexner) type "X." The kitchen and the personnel were carefully investigated but the fact that no cases had occurred on the male side of the hospital suggested a carrier among the female patients or attendants. No new cases developed until September 22, when 1 occurred, 1 on the 24th, 1 on the 27th, and the last on the 28th. The case on the 24th was in the secluded section, separated from

the rest of the women. On the 28th one of the so-called well patients was discovered in the isolation room of a dysentery patient, supporting her and holding a sputum cup. She had eluded the maid. She had been accustomed to assist in carrying trays at meal time and was very solicitous in giving attention to other patients, such as combing their hair, assisting them to the toilet, etc. Her stools showed exudate and were positive for *S. dysenteriae* type "X." It was found that 2 or 3 times a month this patient had refused to work and stayed in bed. Although she was having several liquid bloody stools per day, she was up, active and complaining bitterly because she was isolated. No new cases developed following her isolation. Only 1 patient died, of bronchopneumonia on the 56th day after the onset of her dysentery. At autopsy no lesions were found in the intestines.

The only association between the male and female sides occurs when doctors or nurses visit the wards. The kitchen serves both sides, but following the recognition of dysentery all utensils used for food to the affected patients were sterilized before being brought back to the kitchen.

OUTBREAK AMONG THE MALE PATIENTS

October 14, 1936, diarrhea developed on the male side of the hospital, in a decrepit man with advanced central nervous system lues. He had been subject to gastrointestinal upsets with diarrhea or constipation, but because the staff was on the lookout for diarrheal disease, he was immediately isolated. On October 18, diarrhea developed in another patient, but neither showed exudate in the stools and cultures were negative. October 21, another case of bacillary dysentery occurred. Other cases developed as follows: October 25, 1; October 29, 1; November 1, 2; and 1 each on November 3, 8 and 10. Characteristic exudate was present in the stools, and cultures gave *S. paradysenteriae* type "W." Thus the cultures showed that the source of the epidemic on the male side was different from that in the female wards. In an effort to locate the source, the feces of all patients admitted to the male side within 3 months prior to October 21 were cultured. Rectal swabs were utilized and culture plates inoculated directly. One carrier of *S. paradysenteriae* type "W" was found, a patient with advanced psychosis with syphilitic meningo-encephalitis. He was deteriorated, confused, filthy in his habits, and wandered around the ward sufficiently to scatter feces about with unusual efficiency. He had never made a complaint of any kind. He was isolated November 9, one day before the last case of this outbreak occurred. One patient 81 years of age, with advanced cerebral arteriosclerosis, died a week after onset. Autopsy revealed some superficial ulceration of the cecum, sigmoid and rectum which was not considered sufficiently severe to have been more than an additional factor.

These 2 outbreaks are reported because they demonstrate the aid which the differentiation of the antigenic type of *S. paradysenteriae* gave by determining that the outbreaks had different sources although they both occurred within 60 days in an institutional population fed from one kitchen. The rôle played by carriers in these epidemics again emphasizes the outstanding importance of this aspect of the epidemiology of bacillary dysentery.

SUMMARY

Two small epidemics of bacillary dysentery in a mental hospital are reported.

Each epidemic was caused by an apparently healthy carrier; isolation of the carrier controlled the outbreak.

Laboratory evidence established the cause, the carrier, and proved the outbreaks had no relation one to the other.

NOTE: The authors express their appreciation to Lt. Col. J. B. Anderson, M. C., Superintendent of Corozal Hospital, Canal Zone, for permission to report these outbreaks, and to Lt. Col. G. R. Callender, M. C., President, Army Medical Research Board, Ancon, Canal Zone, for assistance in the study and in the preparation of this report.

Opium and Other Dangerous Drugs

"The problem of narcotics first came before the Health Committee in 1931 when it was called upon to determine the legitimate requirements of those drugs in various countries. Having laid down the principle that the only legitimate requirements were those in respect of medical and scientific use, the committee, in the light of detailed investigations, fixed the maximum at 450 milligrams of opium and 7 milligrams of cocaine per head of population per year (1924) and this only for those countries with advanced medical organisations. These two figures have since been generally accepted, in particular at the International Opium Conference in 1925 as standards of legitimate consumption.

"An analogous enquiry was undertaken in 1929 in order to determine the world requirements in narcotics with a view to facilitating the work of the Conference on Limitation, planned for 1931. These figures were fixed at 9,700 kilogrammes for morphine, 790 kilogrammes for diacetylmorphine and 6,000 kilogrammes for cocaine, and have successfully withstood the test of time.[1]

After the ratification of the International Opium Convention of 1925, fresh responsibilities of permanent character fell to the Health Committee. Under Article 8 of that convention the committee has since examined the proposals of 18 governments [2] in regard to 290 preparations, 51 of which were considered to be innocuous and were excluded from the scope of the Convention."—Twenty-fifth Session of the Health Committee, League of Nations, May 4, 1937.

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1. According to the Permanent Central Opium Board, 9,413 ks. of morphine, 674 ks. of diacetylmorphine and 4,002 ks. of cocaine were manufactured in 1935 (Document C. 368. M. 242).

2. Argentine, Austria, Bulgaria, Estonia, France, Germany, Hungary, India, Lithuania, Netherlands, Poland, Rumania, Siam, Sudan, Switzerland, Union of South Africa, United Kingdom.

Escherichia-Aerobacter Intermediates from Human Feces

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THE phrase, "*Escherichia-Aerobacter* intermediates," has been variously employed in the literature of the past decade. At present it customarily refers to coliform bacteria which differ from typical Escherichia or Aerobacter strains in one or more of the major differential reactions, such as the Voges-Proskauer, methyl-red and citrate utilization tests. Recent discussion has tended to confine the designation to those organisms which are Voges-Proskauer-negative, methyl-red-positive, and capable of multiplying in a medium containing citrate as the sole source of carbon.

Apparently the intermediates are found as ubiquitously as are any of the other coliform bacteria. The first reports of such intermediate bacteria were made by Koser [12-16] who isolated a number of strains from soil, water, and human and animal feces. Lewis and Pittman [21] also obtained intermediates from water, either polluted or unpolluted. Intermediates have been found in feces by Kline,[10] Skinner and Brudnoy,[32] Parr,[22] Shunk,[30] and Tittsler and Sandholzer.[33] The latter authors also studied strains isolated from urine, water and soil. Kline,[10] Kon,[11] and Yale [37] obtained citrate-positive, methyl-red-positive, Voges-Proskauer-negative coliform bacteria from milk and other dairy products. Levine, *et al.*[20] found similar organisms in eggs. Hajna and Perry [9] obtained intermediate strains from the intestinal contents of various cold-blooded animals, and Griffiths and Fuller [8] likewise found intermediates in commercial fish and fillets.

Intermediates have also been reported in water by Ruchhoft, *et al.*,[27] Gray,[7] Poe,[24, 25] France,[6] and Parr and Caldwell.[23] The latter authors found that 8.4 per cent of 1,407 samples of well water contained intermediate coliform bacteria. They stated that in no case where intermediates occurred could the possibility of fecal pollution be excluded. A question which naturally arises concerns the frequency with which intermediates occur in human feces. The present investigation was undertaken as an attempt to provide data upon this point.

EXPERIMENTAL

A. *Isolation of Strains*

Four hundred and sixty-six samples of human feces were plated on eosin-methylene-blue agar after a preliminary 8 hour enrichment in lactose broth. One or more colonies of both Escherichia and Aerobacter types (Levine [19]) were picked and tested for utilization of citrate, and for their reactions in the Voges-Proskauer and methyl-red tests. The latter tests were performed on cultures in Clark and Lubs's [5] synthetic medium which had been incubated for 2 days at 37° C. Voges-Proskauer

tests were made by use of creatin and Leifson's [18] reagent. The Voges-Proskauer and methyl-red tests were later repeated on glucose-phosphate-peptone cultures after 3 days of incubation at 30° C. In this case acetyl methyl carbinol was detected by the Barritt [2] modification of the Voges-Proskauer test, for which a much greater delicacy is claimed. Citrate utilization was determined by growth and formation of alkali on Simmons's [31] citrate agar, and later checked in Koser's [12] synthetic liquid medium, with incubation at 30° C. and 37° C. The reactions of strains reported in this study did not change on replating or on aging.

The distribution of coliform bacteria in the 466 samples of human feces is shown in Table I. Samples are grouped in the table according to the types of coliform bacteria occurring in them. This table cannot be considered an exact index of the occurrence of coliform bacteria in all human feces, due to the fact that not all colonies on each plate were tested: the average number of colonies picked was 5. Therefore it is possible that Escherichia was simply overlooked in the 45 samples in which this type was apparently absent. The failure of growth of coliform bacteria on plates from the 12 samples in Group 8 may have been due to overgrowth by fluorescent bacteria.

It is of interest to note the relatively widespread occurrence of citrate-positive organisms in human feces: in the present investigation 49.8 per cent of the samples contained such strains. This figure is somewhat higher than those reported by many previous workers (see Ruchhoft, *et al.*[27]) and confirms the fallacy of employing the citrate utilization test as an indication of the non-fecal origin of bacteria in water. Furthermore, the presence of intermediate strains in 13.3 per cent of the samples demonstrates that this group may be of sanitary significance.

Table I also shows that from only 1 sample was an intermediate strain isolated in the apparent absence of other coliform bacteria. In this particular case, only 2 colonies were picked, the other later failing to ferment lactose. It may therefore be said that almost without exception the intermediate coliform bacteria are accompanied in human feces by either Escherichia or Aerobacter strains or both, as in Groups 3, 5, and 6. Furthermore, the data show that less than half (47.6 per cent) of the samples studied contained only Escherichia strains.

In several instances analysis of suc-

TABLE I

Occurrence of Coliform Bacteria in Human Feces

	Escherichia	*Aerobacter*	*Intermediate*	*Number of Samples*	*Per cent of Total*
Citrate	—	+	+		
M. R.	+	—	+		
V. P.	—	+	—		
Group					
1	Present	Absent	Absent	222	47.6
2	Present	Present	Absent	152	32.6
3	Present	Present	Present	31	6.7
4	Absent	Present	Absent	18	3.9
5	Present	Absent	Present	16	3.4
6	Absent	Present	Present	14	3.0
7	Absent	Absent	Present	1	0.2
8	Absent	Absent	Absent	12	2.6
Samples containing	421	215	62	466	100.0
Per cent of Total Samples	90.3	46.1	13.3		

cessive samples from one individual indicated that intermediates were always present. In 1 case this has been true for 2 years.

B. *Characterization of Strains*

One hundred and seventeen strains of intermediates, together with 8 strains obtained through the courtesy of Dr. Werkman of Iowa State College and Dr. Tittsler of the University of Rochester, were further studied in an attempt at classification. These were tested repeatedly over a period of 8 months in litmus milk and in various carbohydrate media; hydrogen sulphide production was determined in lead acetate agar and in peptone iron agar, and motility was tested in 18 hour nutrient broth cultures, and in semisolid agar. All cultures were incubated at 37° C. Carbohydrate media were prepared by addition of 0.5 per cent or 1.0 per cent of the carbohydrate to ordinary nutrient broth; the reaction was adjusted to pH 7.0. Carbohydrate cultures were observed for production of acid and gas daily for 2 weeks. Litmus milk cultures were observed daily for 10 days, and lead acetate or peptone iron agar cultures daily for 1 week.

In addition, nutrient gelatin cultures were incubated at room temperature for 30 days and observed periodically for liquefaction by placing in the refrigerator at 5° C. for 2 hours. Indol production in 1 per cent Bacto tryptone cultures was determined after 24 and 48 hours of incubation at 37° C. by use of Kovács's [17] reagent. Reduction of nitrate in a 0.1 per cent KNO_3 nutrient broth medium was determined after 24 hours of incubation at 37° C. with sulfanilic acid and dimethyl-alpha-naphthylamine. Morphology, Gram reaction, and spore formation were studied in 18 to 24 hour nutrient broth cultures.

The characteristics common to all the intermediate strains are as follows:

Gram stain	Negative
Morphology	Rods
Spore formation	Negative
Motility	Positive (4 exceptions)
Citrate utilization	Positive
Methyl-red test	Positive
Voges-Proskauer test	Negative
Gelatin liquefaction	Negative
Indol production	Negative
Nitrate reduction	Positive
Arabinose fermentation	Acid and gas
Cellobiose fermentation	Acid or acid and gas (1 exception)
Galactose fermentation	Acid and gas
Glucose fermentation	Acid and gas
Lactose fermentation	Acid and gas

It is of interest to note that all but 1 of the 125 strains fermented cellobiose with the formation of acid or acid and gas. Tittsler and Sandholzer [34] have recently reported fermentation of this carbohydrate by 38, or 84.4 per cent, of 45 citrate-positive, methyl-red-positive, Voges-Proskauer-negative strains of coliform bacteria.

The heterogeneity of the intermediate strains is shown by Table II. On the basis of 6 reactions, the 125 strains formed 28 groups of 1 to 32 strains each. In the present experiments fermentation of raffinose paralleled closely that of sucrose. Winslow and Walker [36] observed a similar correlation in studying differential tests for the colon group of bacteria.

DISCUSSION

The problem of allocating such strains as these in a system of bacteriological classification is difficult. Bergey [3] distinguished between the Escherichia and Aerobacter genera on the basis of acetyl methyl carbinol production from glucose. However, for the past few years it has been common practice to include the methyl-red test and utilization of the citrate radical as criteria of the genus to which a given coliform bacterium belongs. Braak [4] described several strains of an organism designated *Bacterium freundii*, which

TABLE II

Heterogeneity of Intermediates from Human Feces

Group	Milk*	H_2S	Sucrose†	Salicin†	Dulcitol†	α-Me-Gluc.†	No. of Strains
1	+	+	+	+	+	+	4
2	+	+	+	+	+	—	1
3	+	+	+	+	—	+	1
4	+	+	+	+	—	—	4
5	+	+	+	—	—	—	8
6	+	+	—	+	+	+	8
7	+	+	—	+	+	—	1
8	+	+	—	+	—	+	1
9	+	+	—	+	—	—	1
10	+	—	+	+	+	+	17
11	+	—	+	+	—	+	1
12	+	—	+	+	—	—	5
13	+	—	+	—	—	—	2
14	+	—	—	+	+	+	9
15	+	—	—	+	—	+	2
16	+	—	—	+	—	—	1
17	—	+	+	+	+	+	2
18	—	+	+	+	—	—	10
19	—	+	+	—	+	+	1
20	—	+	+	—	—	+	1
21	—	+	+	—	—	—	7
22	—	+	—	+	+	+	32
23	—	+	—	+	—	+	1
24	—	+	—	+	—	—	1
25	—	—	+	+	—	+	1
26	—	—	+	+	—	—	1
27	—	—	+	—	+	+	1
28	—	—	—	+	+	+	1
							125

* A (+) sign indicates acid coagulation, (—) indicates acid reaction.
† A (+) sign indicates acid or acid and gas, (—) indicates no change.

occupied an intermediate position when classified by these tests, but made no further attempt to classify them. Werkman and Gillen [35] proposed adoption of the genus name Citrobacter, designated primarily to include those organisms which produce trimethylene glycol from glycerol under anaerobic conditions. Secondarily it was stated that all strains studied were citrate and methyl-red-positive and Voges-Proskauer-negative, or only weakly positive.

This suggestion was immediately attacked by Skinner and Brudnoy,[32] who studied 63 intermediate strains isolated from human feces, on the ground that recognition of the genus would pave the way for proposal of innumerable other genera characterized by only minor differences from the established genera of coliform bacteria. It was later stated by Tittsler and Sandholzer [33] that

> . . . the heterogeneity of the *Escherichia-Aerobacter* "intermediates" renders it extremely difficult, if not impossible, to establish a new genus which will separate them from both the Escherichia and Aerobacter genera and yet in itself be sufficiently inclusive.

The above statements are emphasized by the data shown in Table II. Werkman and Gillen, studying 15 strains of trimethylene glycol-producing organisms, described 7 species to be included in the genus Citrobacter. Only 5 of our 125 strains (groups 3 and 4 in Table I) correspond to any of the species suggested by Werkman and

Gillen. These strains resemble *Citrobacter freundii* (fermentation of alpha-methyl glucoside was not reported in the original characterization).

It is therefore evident that a complete classification of the intermediate strains would involve acceptance of very many new species, as well as new genera based on different combinations of the citrate, methyl-red and Voges-Proskauer reactions. At present, however, the major problem appears to be that of proper generic allocation of the intermediates. As mentioned previously, the proposed genus Citrobacter was defined primarily on the basis of trimethylene glycol production from glycerol under anaerobic conditions. The procedure involved in this test is laborious and time consuming, and outside the scope of the ordinary bacteriological laboratory. Furthermore, it is a question whether one such feature is sufficient to justify establishment of a new genus, since to be of practical use a genus should be defined by easily applied tests which represent distinctive physiological characteristics. The genus Citrobacter could therefore be redefined to include all Gram-negative, aerobic, non-sporeforming bacteria which produce acid and gas from dextrose and lactose, and are methyl-red-positive, Voges-Proskauer-negative, and utilize citrate as a source of carbon.

The alternative solution is to include the intermediates in already existing genera. This suggestion is supported by several considerations. In the first place, the genera Escherichia and Aerobacter are distinguished by fundamental differences in their physiology, as shown by the schemes for fermentation of glucose devised by Scheffer,[29] Reynolds,[26] and others. Simple tests (methyl-red and Voges-Proskauer) are available by which these differences can be demonstrated. It has not yet been shown that a fundamental difference exists between the citrate positive and negative Escherichia strains. Production of trimethylene glycol may or may not be evidence of such a difference. However, Schaeffer[28] has shown that 12.9 per cent of 70 citrate-positive, methyl-red-positive, Voges-Proskauer-negative intermediate strains failed to ferment glycerol in a peptone-water medium, so it appears possible that strains may be found which do not produce trimethylene glycol from glycerol. Utilization of citrate may be a fundamental physiological characteristic, but this has not yet been shown. Its correlation with production of acetyl methyl carbinol in the Aerobacter genus may be purely fortuitous.

The intermediates considered in this paper could be classified as Escherichia strains which possess the ability to utilize citrate as a source of carbon. However, there exist strains of intermediate coliform bacteria which are not included in this group. Ruchhoft, *et al.*,[27] Bardsley,[1] and Barritt[2] have described intermediates which utilize citrate, and are methyl-red- and Voges-Proskauer-positive. The first named authors have also described organisms which are citrate positive but methyl-red- and Voges-Proskauer-negative. Therefore it seems logical to include all intermediate coliform strains in the genera Escherichia or Aerobacter as at present defined, at least until such time as they have been shown to possess distinct physiological differences which justify establishment of new genera. Intermediates could then be distinguished from the recognized members of these genera by sub-dividing on the basis of citrate utilization and the methyl-red test.

CONCLUSIONS AND SUMMARY

1. Citrate utilizing coliform bacteria have been found in 49.8 per cent of 466 samples of human feces. Thirteen and three-tenths per cent of the samples contained organisms of the citrate-positive, methyl-red-positive, Voges-Proskauer-negative intermediate group,

thereby demonstrating that the latter are of sanitary significance. Such intermediates do not usually comprise the sole coliform bacterial flora of the human intestine, although they may be found characteristically present in certain individuals.

2. The cultural and physiological characteristics of 125 intermediate strains showed a heterogeneity which rendered impossible any attempt to classify them according to present schemes.

3. It is suggested that the coliform bacteria be classified primarily on the basis of acetyl methyl carbinol production from glucose, and secondarily on utilization of citrate as a sole source of carbon and on the methyl-red reaction. Intermediate strains would then be allocated to the genera Escherichia or Aerobacter, and distinguished from organisms at present included in these genera by their citrate and methyl-red reactions.

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CURATIVE AND PREVENTIVE MEDICINE

THAT there are fashions in medicine goes perhaps without saying, some due to new discoveries and general advances in our knowledge, some to fads introduced by some "bright light," and followed by those who do not know enough to detect a fallacy, or are not willing to think for themselves.* In preventive medicine the same thing holds true, though here the influences of great foundations and of governmental agencies are often directing forces. However, in this branch of medicine most of the newer lines of work are based on extensive studies, national and even international, and are, to that extent, reasonable. A short time ago we pointed out that in England, housing, with its concomitant abolition of slums and overcrowding, and the question of nutrition, were much to the fore. These two conditions have been the subject of studies in many parts of the world and one can hardly doubt that they are among the most important lines of endeavor. To these may be added a subject which has been much considered in this country as well as others—physical education—and another which is much written about but which has fared badly, practically—maternal mortality.

Three of these public health matters are distinctly preventive in their effect, and have for their object the bettering of health for those now living, but particularly for those in the next generations. That they will have some effect on the general death rate may be taken for granted, but as far as we know, they will not affect the death rate from the diseases which cause the greatest number of deaths in adults; diseases of the heart and arteries, in which syphilis plays a very large part; cancer, which apparently is on the increase; and pneumonia, one type of which often strikes the robust, and another which so frequently follows diseases

* Just now dish washing and cleanliness of eating utensils are attracting much attention in this country.

like influenza, which is now endemic with exacerbations practically every year. One might reasonably expect that there would be a favorable influence on the death rate from tuberculosis, but, as has been pointed out by many, and especially by Dr. E. Burnet,[1] the death rate from tuberculosis has been falling for a number of years, apparently without regard to the measures being taken in every country for its prevention. It was held that these preventive measures are most successful where the death rate has begun to fall apparently of its own accord. Some authorities believe that the wave of epidemic tuberculosis has spent itself and the disease has now reached its endemic level, at which it will remain in spite of efforts against it. This of course is largely theory, but must be considered. If we measure our success by the death rate, we must remember that in proportion as we increase the average age of the population, so does the death rate from certain diseases increase. The lessening of the death rate in childhood, for example, brings more people to the age when cancer becomes a menace.

Much has been written on the part the general practitioner plays in prevention. Before the days of bacteriology we did not know much about prevention and did not try to practise it to any great extent. Now every conscientious practitioner is also practising preventive medicine. What other instance is there of a profession, great or small, in which the members are constantly engaged in putting themselves out of business? Vaccination against smallpox and typhoid fever, for example, may be mentioned, but there are few branches of medical science in which there is now more activity than in the attempted prevention of all contagious diseases by vaccines or chemical substances like quinine, salvarsan and its congeners, and that most remarkable and most recent discovery, protonsil. Prevention by other means has reached its limit; vaccines seem to be the only hope. Take the acute respiratory infections which are our greatest stumbling block. Will we ever be able to quarantine for the ordinary acute cold or mild bronchitis? What protection is there in schools against these common infections except vaccination? How much would quarantine and isolation cost, and how long will it be before the public will stand for such measures, yet as far as loss of time and inconvenience goes, acute coryzas stand well at the top of all diseases.

It must be perfectly clear to every thoughtful person that curative medicine and preventive medicine cannot exist one without the other. There should be no jealousy between the two, yet we know that there is a very strong feeling on the part of many practitioners against certain types of preventive medicine, some of which has been engendered by the ill considered demonstrations by great lay foundations or unwise programs on the part of health departments.

To those of us particularly interested in the preventive side of medicine, it is extremely gratifying to see how our branch has come into its own. As said recently concerning preventive medicine:

> . . . although much the younger, has the greater achievements to its credit, for it has abolished some diseases entirely and greatly diminished the incidence of others; it has enormously reduced the death rate and has added materially to the expectation of life.

Unquestionably a number of other factors have aided in producing these results. Jealousies have been brought about and disappointments created by exaggerated claims for preventive measures, and the disillusionment which has come from partial or complete failure of some of these loudly proclaimed salvations has injured the general cause.

A word about curative medicine must be said. The campaign for early diagnosis as a preventive measure is applicable only to chronic diseases like tuberculosis and cancer. We must remember that practically all of the infections which gain entrance through the upper respiratory tract are most contagious during the first few days when, according to our present practices, the sick person is often not under the care of a physician, and is never isolated or hospitalized. Some 30 years ago there appeared in England a book which presented this side of the question in an unusually striking fashion. The facts are incontrovertible, yet our methods remain much the same. We lock the stable after the horse has escaped. Treatment has shown great advances and the sick person is in many cases no longer the dangerous focus of infection that he was formerly. Unfortunately from this standpoint, some of our most remarkable successes have been in noncontagious diseases (as far as we now know), like diabetes, pernicious anemia, etc.

The thoughts and facts presented here are not new, though we venture to say that they are too little realized and acted upon. They have recently been collected and brought to our attention in an unusually thoughtful address.[2] We can do no better than to close with the words of the lecturer:

> It is surely better to face the facts without illusions, for "things are what they are and their consequences will be what they will be. Why, then, should we seek to be deceived?"

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LEST WE FORGET

IF we should say that Americans were too modest there would doubtless be many to dispute it. From foreign lands there would almost certainly be a chorus of protest—perhaps a just one. However, there are certain qualities in evidence in our scientific people which might possibly be construed as meaning this quality. It is perfectly certain that we have never given sufficient credit to our own scientific people, especially the pioneers. It is still true, though fortunately not so true as it was, that instead of studying and quoting American literature, practically every writer refers by preference to European articles and European authorities. No doubt there was some reason for this 25 years ago, but now there is no question that in science our workers are the equals of any in the world and our laboratories as good as any.

In regard to public health, we are accustomed to refer to the work of Chadwick and to credit him with being the first to bring about the awakening which has resulted in the enormous amount of fruitful endeavor now so much in evidence. Especial credit is due to him, since at that time the science of bacteriology had hardly been born, and nothing is further from our mind than to detract one iota from the work of great men in foreign countries. We hold, however, that we have neglected our own great men, and we welcome every evidence of awakening recognition of our own people.

We feel that a distinct service has been done by bringing to the attention of the Health Organisation of the League of Nations, and through it to the American public, a remarkable piece of work of which comparatively few are aware; namely, "the first attempt to elaborate a complete system of appraisal of health con-

ditions together with administrative activity," made some 60 years ago by the late Dr. John S. Billings, Surgeon in the United States Army, and founder of the Army Medical Library.[1] Either one of these accomplishments would have been sufficient to make him famous. Dr. Billings says in his covering letter, dated Washington, D. C., August 25, 1875: "These questions are intended to obtain, as far as possible, the information which would be desired in estimating the healthfulness of a given place, and to ascertain the local and especially the preventable causes of disease at that point. Facts and not opinions are desired, and the questions are drawn up in that point of view."

The following chapter headings show the broad conception which Dr. Billings had in that early day:

A. Location, Population and Climate
B. Topography and Geology
C. Water Supply
D. Drainage and Sewerage
E. Streets and Public Grounds
F. Habitations
G. Gas and Lighting
H. Garbage and Excreta
I. Markets
K. Slaughter-houses and Abattoirs
L. Manufactories and Trades
M. Public School Buildings
N. Hospitals and Public Charities

As pointed out, Dr. Billings showed in regard to several matters a wider conception of public health activities than that which has prevailed until recently. The writers say further: "It is truly remarkable that Dr. Billings should have recognised and emphasised sixty years ago the influence upon public health of urbanism, housing and overcrowding, which, in his own country, are not yet viewed as matters of public concern in relation to health. There are questions as to the employment of women and children in factories, and diseases due to working conditions. In the chapter on schools, questions are asked, not merely regarding sanitation of the premises, but in regard to playgrounds, indoor and outdoor physical exercise, and the result of medical examinations and tests of vision."

The average person does not appear to realize what pioneer work involves. The majority of us are more or less like sheep—some leader gives birth to a great idea which strikes a responsive chord, others follow because it becomes popular, others in order to go with the crowd, and a choice few because they realize the fundamental importance of the new concept. Those who lived through this awakening to public health remember how slow the majority were to accept and act upon the facts. In spite of the present tremendous activity, most of our universities and medical schools have not shown the progress in regard to the teaching of preventive medicine and public health one might expect. We believe that one of the most significant as well as hopeful features of the situation lies in the fact that a number of historians are now delving into medical archives to find the explanation of certain trends in our civilization and life.[2, 3]

This *Journal* delights in doing honor to the great men of our own country. As a people we believe that we have been too much taken up with practical affairs to render due homage to those who have gone before. We offer what we know to be a deserved tribute to Dr. John S. Billings.

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LETTER FROM GREAT BRITAIN

THE CORONATION AND HEALTH CONFERENCES

Amongst the vast numbers who came from overseas to take part in the celebrations associated with the Coronation of King George VI, there were many connected professionally or otherwise with public health work in various parts of the Empire. The advantage of bringing together these representatives to exchange views and experiences was recognized, and numbers of conferences were arranged. One of the earliest had for its object discussion of the various problems associated with the prevention and control of tuberculosis in various parts of Great and Greater Britain. Chiefly responsible for the Empire Conference on Tuberculosis, as it was described, was Sir Pendrill Varrier-Jones, whose work as Director of the Colony at Papworth and in connection with tuberculosis generally, is so widely known. The various meetings were well, though not largely, attended, and were very interesting because representative of so many of the countries within the British Comity of Nations. The fact that, in addition to the Minister of Health delivering an address of welcome to the delegates, the Government provided an evening reception in their honour, suggested that the conference was regarded as of considerable importance.

TUBERCULOSIS CONFERENCES— IMPERIAL AND OTHER

That Sir Arthur MacNalty, Chief Medical Officer of the Ministry of Health, attended to read a paper on the modern outlook on tuberculosis, and none but members of the peerage, amongst them Lord Horder, Lord Dawson, and Viscount Goschen, presided at the various sessions, heightened this impression. Of the noble lords, most had something to say that gave encouragement even to the workers who mostly need it; those in India, for example, in districts where the tuberculosis problem is of proportions that almost defy all efforts at solution. Lord Horder was one exception, his contribution containing a suggestion that there was no real reason, as some claimed, for believing that we were well on the way to securing control of the disease. Six times as many persons, he said, died of tuberculosis annually as were killed in street accidents, and every 24 hours in England saw 90 perish of consumption. Lord Horder was practically the only speaker to strike a lugubrious note; everybody else putting a bright face upon it, as if to support the frequent assertion that so far as the infected were concerned, the aim should be to ensure happiness and a contented mind. At Papworth, because those who were sent there to settle were given work to do and were paid for their work, happiness and contentment reigned. So, apparently, it does in Canada, if one may judge from what Dr. Wodehouse had to say. Most of the success attending the Canadian efforts, it appeared to me, came because the line followed was that adopted in the United States in relation to tuberculosis. A similar course, I rather gathered, in his view, might be pursued with advantage by us here, our scheme not being much to his liking.

Amongst other speakers from overseas, several proved most impressive, amongst them the representatives of India, Sir Cuthbert Sprawson; of Australia, Dr. Collins; of the Straits Settlements, Dr. MacGregor; of Nigeria,

Dr. Canchi; and of the Transvaal, Dr. Pringle, whose description of the fight against silicosis and tuberculosis and the progress made attracted a vast amount of attention. Conspicuous amongst the British authorities contributing, were Sir Henry Gauvain and Sir Pendrill Varrier-Jones, the latter of whom entertained the delegates at Papworth, and explained the methods adopted at the Village Settlement there.

CONGRESSES ON HEALTH AND MATERNITY AND CHILD WELFARE

Meetings are scheduled for the Health Congress of the Royal Sanitary Institute, and the English-Speaking Conference on Maternity and Child Welfare. Both of these are annual events, and the bodies concerned have made special efforts this year in connection with their arrangement, anticipating the presence of more visitors from overseas than usual. The Royal Sanitary Institute Congress meeting place is Birmingham, one of the most progressive cities in the country in public health and all other directions. The very enthusiastic Medical Officer of Health is Dr. Newsholme, a nephew of Sir Arthur Newsholme, whose name and work are so well known in the United States. In many ways the Health Congress of the Royal Sanitary Institute resembles the Conferences of the American Public Health Association, and I propose to write fully of the proceedings later. In the meantime, I mention that at the various sections, matters both of local and general moment, ranging from care of the preschool child to anti-malarial marsh reclamation and drainage, will be discussed under the presidency of persons of high local, national, or international notability. The Conference on Maternity and Child Welfare takes place in London. Like the Empire Tuberculosis Conference, it receives special recognition at the hands of the Government, its delegates being accorded a reception at a one-time ducal mansion in the very fashionable St. James's quarter of the Metropolis, Lancaster House, more or less reserved for purposes of reception by the Government and ministerial heads of departments. As the conference describes itself as an "English Speaking" one, it is not surprising to find that the hope is nourished that representatives from the United States will attend and take part, the idea which, it is said, will run through the whole conference being "the further evolution of the maternity and child welfare movement throughout the British Empire and in the United States."

MATERNAL MORTALITY IN ENGLAND AND WALES

Though to a great extent accidental, the moment of the holding of this conference is particularly appropriate, coinciding as it does more or less with the issue of the report of the Ministry of Health on maternal mortality. The investigation upon which the report is based, followed and to an extent arose out of those conducted by the special departmental committee set up in 1928 to go into the whole question, and that finally reported in 1932. The present investigators were all medical officers of the Ministry of Health, which is a guarantee that the work was thoroughly done, and that the statements in regard to conclusions and recommendations are reliable. The enquiries were carried out in special areas; those in which the puerperal mortality rate for the decade 1924–1933 was higher than 5 per 1,000, and, for purposes of comparison, certain others in which during the same period the rate was relatively low. Investigating causation, the officers concerned took a wide view and enquired into a large number of factors that might

conceivably or that had been alleged to have an influence—poverty, unemployment, overcrowding, malnutrition, and so on. In almost every case, the evidence was inadequate to permit of the incrimination of any one of the factors. So far as conditions contributing to maintenance of a high rate are concerned, the investigators found themselves compelled to draw particular attention to abortion. The fact of their having done so was taken note of particularly by the press and widely commented upon, as was the determination expressed by the Minister of Health to set up a special committee to enquire into its prevalence, and to see generally what could be done about it.

A COMMITTEE ON ABORTION

The committee set up for this purpose has a most interesting composition, being presided over by a most distinguished lawyer, and including the wife of the Prime Minister (Mrs. Baldwin) and the daughter of Elinor Glyn—(Lady Williams), who are and have been, both of them, greatly interested in all matters connected with maternal welfare. In addition, there are several specialists in obstetrics, a medical officer of health—one only—and a coroner. Amongst the recommendations in the report, the chief have already been made the subject of direction by the Minister to local health authorities. Most of these aim at improving the quality of assistance rendered to women, not only at confinement but ante- and post-natally as well. Very definitely there is a call for the appointment and employment of specialists in obstetrics to act apart from or in consultation with general practitioners and midwives. One thing that has appealed to the public is what is described as the "flying squad," to consist of a specialist or specialists who will form an emergency domiciliary service in cases of grave obstetric abnormality in which removal to hospital is contra-indicated. The reason behind the suggestion to set up these squads was the discovery that in some places the mortality reports contained reference to cases in which death had occurred during transit to hospital of women suffering from eclampsia or hemorrhage or severe shock. Though the report is one having reference entirely to conditions and cases here, it is probable that it contains much that must have interest and value elsewhere. Like the run of Ministry of Health reports, it is interestingly written and very practical.

HONOUR FOR AN HONORARY F.A.P.H.A.

The Society of Medical Officers of Health at the May meeting, proceeded, as usual, to the election of the President for the next session. On this occasion, choice fell upon Dr. James Fenton, Medical Officer of Health of Kensington. Dr. Fenton, it may be remembered, took part in the symposium by British Health Officers at the Annual Conference of the Association at Montreal in 1931, and had then conferred upon him the Honorary Fellowship of the American Public Health Association; an honour, I know well, he prizes very greatly.

CHARLES PORTER, M.D.

31st May, 1937.

PUBLIC HEALTH EDUCATION*

"Immediate objectives of health propaganda in Great Britain were defined in a recent memorandum of the Central Council for Health Education, as follows:

"1. To attract the attention of those not already interested in health and hygiene, and in need of information on the subject."

"2. To impart information of the most up-to-date character in the simplest and soundest form to those whose interest has been aroused."

"3. To inspire action and change of habit on the basis of the information given."

New York in October, 1937—The Public Education Section Council and special committees are busily engaged in preparation for Section participation in the A.P.H.A. Annual Meeting.

A health education headquarters will be maintained. Several committees will have reports.

What have you to offer for display at headquarters?

Broadcasting in Manitoba—Three weekly broadcasts are put on the air by the Bureau of Health Education, Department of Health and Public Welfare. The Bureau is part of the Division of Disease Prevention, Legislative Building, Winnipeg.

"Health Problems of Today" go on the air Tuesday and Friday, 3:45 to 4:00 p. m. via Stations CKY and CKX.

Checking up on the human organism . . . High road to dental health . . . The art of growing old gracefully . . . The hazards of occupations . . . Food poisoning and how to avoid it . . . Why food should be cooked properly . . . What shall we eat: infancy and preschool; school and adolescence; maturity and middle age; old age . . . Can you prove you were born? . . . Can you believe your own eyes? (statistical facts) . . . Child health as reflected in vital statistics . . . Understanding our children (series of 6 talks by the Parent Education Association of Winnipeg) . . . Our social health (series of 4 talks) . . . Helping the hard of hearing (series of 6 talks by the Winnipeg League for the Hard of Hearing) . . . Why clean up? (series of 6 talks) . . . Accident prevention . . . Preventing hay fever . . . Vacation dangers . . . Building health in summer.

A series of dramatized episodes in the life of the Healthwell Family are presented Tuesdays, 7:45 to 8:00 p. m., via Stations CJRC and CJGX, will give

. . . interesting sidelights of daily happenings which relate to personal health and well-being, as well as discussion of various questions which affect health and social relationships.

The "Our Social Health" series specifically mentioned venereal disease and syphilis. Mimeographed copies are available.

Boys' Clubs Seek Health—Dr. Livingston Farrand heads the committee which has outlined a health program for boys' clubs under the sponsorship of Boys' Clubs of America, 381 4th Ave., New York, N. Y. An extensive manual will appear in several parts

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

treating of health service, health supervision, and health instruction. Part one, "Health Service," has been issued. Contents:

Determine the need for health service . . . Outline the proposed program . . . Obtain the interest and support of important agencies and individuals . . . Prepare a budget for the proposed program . . . Secure boys' club board of directors' approval . . . Organize the approved program . . . The program in operation . . . Recognize physical fitness of boys . . . Publicize the program.

Price to health workers, *20 cents*.

Send a Copy to the Editor—*The Health Officer* (May, 1937) quotes from *Journal of American Medical Association* and *American Journal of Public Health*, about the vicious cancer article in *Coronet*, adding comment of their own.

We hope that all who quote or comment concerning that article will send marked copies, or marked pages to *Coronet*, 919 N. Michigan Ave., Chicago, Ill.

4-H Club Health Education—Among the increasingly useful rural health education centers is the 4-H Club. A glimpse of what is being done in New York State comes from *Health News*, Albany (Dec. 21, 1936):

St. Lawrence county 4-H clubs have begun their health education program with a study of safety in the home and on the farm. A leaders' training conference was held in Canton, November 23, with an attendance of 25. S. W. Sayer, M.D., district state health officer, presided. The organization of the program was carried out by B. J. Rogers, county 4-H club agent, with the coöperation of Dr. Sayer and Mrs. Ethel M. Hendriksen of the Division of Public Health Education.

Discussion handbooks supplied by the Canton chapter of the American Red Cross were distributed together with other material for the use of leaders. Five lessons will be presented covering the prevention of falls; fires; accidents due to tools and machinery; carbon monoxide and other poisonings; care of animals.

Club member participation will be encouraged through a survey of the home and the farm for conditions which might cause accidents; preparation of short essays, posters, scrapbooks and notebooks on observations. Certain of these materials will be exhibited at the county fair.

Juvenile granges will take part in this project also.

Through this program it is possible to reach 1,000 boys and girls.

"As Long as the Supply Lasts" — Some thoughtful correspondents write to explain that they will send to health workers copies of printed matter of which they send samples to the editor. When they, very reasonably, would like to receive return postage we wish that they would mention *2 cents*, or *3 cents*, or *10 cents*, or whatever it may be.

But it seems unnecessary to add in our reference to the printed matter that samples will be sent "as long as the supply lasts." Is not that fact necessarily true in all cases, inasmuch as there can be no obligation when the supply is exhausted?

At any rate, whoever cares for samples had better write promptly before all the procrastinators get busy.

RADIO

Two reports on the A. M. A. dramatizations are available. "Dramatizing the Health Message," and "Evaluating Health Dramatizations," appeared in *A. M. A. Bulletin*. For copies write to Dr. W. W. Bauer, A. M. A., 535 N. Dearborn St., Chicago, Ill. *Free*.

"Guideposts for Producing Educational Programs," in *Education by Radio*, 1 Madison Ave., New York, N. Y. April, 1937. *Free*. Gives 16 pointers for those building a radio program, including more than a talk.

A report of the 6th annual radio contest conducted by Minnesota Public Health Assn. appears in *Everybody's Health*, 11 W. Summit Ave., St. Paul. Feb., 1937. *10 cents*.

"Man Against Germs," one of "The World is Yours" series. Ask for March, 1937, issue of *The World Is Yours*, Office of Education, Washington, D. C. *Free.*

"This is Negro Health Week," by Dr. Huntington Williams. Supplied for local adaptation. *Free.* Negro Health Week, U. S. Public Health Service, Washington, D. C.

American Medical Assn. (Tuesday, 4:00 p. m. C.S.T., blue network):

Winter health hazards . . . Don't die of diabetes . . . Scarlet fever . . . Your weight . . . Heart disease . . . Industrial accidents . . . First aid for broken bones . . . This credulous world . . . Spring athletic hazards . . . Mental hygiene.

Baltimore Health Dept. and Medical and Chirurgical Faculty of Maryland:

The collection and removal of garbage . . . How food inspectors do their work . . . Poisonous insect powders and metal polishes . . . The South Baltimore General Hospital . . . Athletics and the school girl . . . The new milk bottle caps (new official practices).

Connecticut State Dept. of Health WTIC, Thursday, 2:15 p.m.):

Marked increase in undulant fever . . . Placing the barrier against syphilis . . . Water and disease . . . Consider the eyes. . . Child health the year around . . . Public health proposals in General Assembly . . . Is mental hygiene of value?

How the public health nurse assists in disease control (May 13) . . . Mastering reality problems (May 20) . . . Irritation a factor in cancer (May 27) . . . Poisons in the home (June 3) . . . How to avoid dental decay (June 10).

Minnesota State Medical Assn. (Thursdays, 2:30 p. m., WCCO):

Women's contribution to the cancer problem . . . Senile dementia . . . Phlebitis . . . Hayfever . . . Stomatitis . . . Marking babies The use of cosmetics . . . Weight control . . . The winning fight . . . Your teeth . . . Carbon monoxide . . . Neglected head injuries . . . Myxedema . . . Crooked teeth.

New York City Dept. of Health (WNYC and WARD):

Too much acid! . . . Food and nutrition . . . Social hygiene day . . . War on syphilis! Diet for the normal person . . . Milk supervision . . . Corrective diets . . . Your shoes and your feet . . . Health after forty . . . Measles is dangerous . . . Leviticus, Chapter XV . . . Are quacks cheaper?

"Public Health and the Venereal Diseases," and "Conquering Syphilis" are broadcasts, via Station WJDX, by Dr. Felix J. Underwood. For printed copies address State Board of Health, Jackson, Miss.

American Medical Assn.:

A fight half won (tb.) . . . Keeping your baby well . . . Healthy mothers . . . Hospitals of today . . . Whooping cough . . . Your summer vacation . . . Doctors assembled.

Baltimore Health Dept. and Medical and Chirurgical Faculty of Maryland:

Baltimore and its ice cream supply . . . Health milestones . . . Rôle of the Y.M.C.A. in the health of Baltimore's youth . . . The activities of the Bureau of Street Cleaning . . . Superstitions in medicine . . . A health officer investigates typhoid fever (dialogue).

Connecticut Dept. of Health:

Allowing the child's personality to develop . . . By their food you may know them . . . How the public health nurse assists in communicable disease control . . . Mastering reality problems (mental hygiene) . . . Irritation: a factor in cancer . . . Helping the teeth to develop.

Hartford Board of Health:

Important knowledge about syphilis.

Hartford Medical Society and Hartford Tuberculosis and Public Health Society:

Child health in Hartford . . . Body mechanics and health . . . All sugar is not sweet . . . Today's dental problems.

Minnesota State Medical Assn.:

Some major health problems . . . Nervous exhaustion . . . Artificial dentures.

New York City Department of Health:

Left-handed chivalry (syphilis) . . . Your child's health . . . Don't ignore hoarseness

. . . Is your child safe? . . . Spring sports . . . Bleeding gums . . . What your baby needs . . . Hay fever time . . . The secret of a good complexion . . . Nature's ancient remedies . . . After the baby is born . . . High blood pressure . . . Your health department and your child.

DATES AHEAD

June, July, August, 1937, in New York City: Health Education Calendar offered by Health Education Section of Welfare Council urges attention to "Summer Health," including maternal and child health, summer care, nutrition, safety and prevention of accidents, getting the preschool child ready for school. For further information address the Health Section at 44 East 23d St., New York, N. Y.

NEW

News Letter, mimeographed bulletin of New York Diabetes Assn., 386 4th Ave., New York, N. Y.

Quarterly Bulletin, Assn. of Dairy, Food, and Drug Officials of the U. S., Care of State Dept. of Health, Louisville, Ky. The first two issues carry material from the 40th annual conference.

One of the newest of the illustrated magazines is *Foto,* 149 Madison Ave., New York, N. Y., *10 cents. Foto* carries condensed text with its pictures which supplement the latter more successfully than some of the other illustrated periodicals. The Aug., 1937, issue devotes two pages to "Miss Anatomy," a demountable model which seems to be more satisfying to the audience than the "transparent" type.

The newest of pocket size magazines is *They Say,* 112 E. 19th St., New York, N. Y. *25 cents.* "Health and psychology" is one of the 13 "fields of basic interest" to be covered. Several devices are offered for reader participation, including monthly postal card debates. In May, 1937, issue:

Drunken driver Nemesis (how a Pittsburgh judge actually jailed driving drunks and judge associates objected) . . . What people like to read—and why (a study of popular magazines and elements in popular writing success) . . . 37,000 auto deaths . . . Sex racketeers promote prudery (handicaps to sane sex education) . . .

Popular Photography (608 S. Dearborn St., Chicago, Ill.) is a popular magazine for the amateur. To a non-photographer it seems to offer much usable material for the health worker who uses a camera, or who is responsible for photographic work by a staff member or an outsider. *25 cents* a copy.

FOR EDUCATION OR REFERENCE

"Health Education Publications." A new list of A.C.H.A. and Joint Committee material. National Education Assn., 1201 16th St., N. W., Washington, D. C. Ask also for list of School Health Education Service reading lists.

"Here and There with the Health Reporter" for May and June is devoted to "reducing safely and sanely. It can be done—but it must be done slowly and carefully." Mats will be supplied. For newspapers, and for health periodicals. Health News Service, 22 E. 40th St., New York, N. Y.

"Humanization of Science," by Dr. Iago Galdston. An address before the Tuberculosis and Health Society of St. Louis. Copies from the author, 2 E. 103d St., New York, N. Y.

"Insects" (injurious to man, etc.). List of government publications for sale by Superintendent of Documents, Washington, D. C. *Free.*

An International Health Congress in the course of the New York World's Fair has been announced. A copy of the statement to the press will be sent to public health workers who care to write to National Health Council, 50 W. 50th St., New York, N. Y.

Two illustrated folders on syphilis as a cause of blindness have been issued by National Society for the Prevention

of Blindness, 50 W. 50th St., New York, N. Y. Samples *free* to health workers.

"Wholesale Life Saving" is "an informal report on the Health Conservation Contests sponsored by the U. S. Chamber of Commerce and the A. P. H. A., and supported by life insurance companies. Good looking but not expensive looking. Blue cover with title outlined in imitation of a rope; nearly square page; little margin at sides, but plenty of white space at top and bottom; unusual for a health publication.

A new price list of publications is available. American Medical Assn., 535 N. Dearborn St., Chicago, Ill. *Free.*

"Be Kind to What Animals?" by V. Heinen. Animal experimentation as seen by a Roman Catholic. Reprint. American Medical Assn. *10 cents.*

"Whom Shall I Consult—Optician, Optometrist, Oculist, Ophthalmologist, or Opthalmic Physician?" by L. L. McCory. Reprint. American Medical Assn. 4 small pages. *10 cents.*

Reprints from *Public Health Nursing* (50 W. 50th St., New York, N. Y.) at *10 cents* each:

"The Function of the Public Health Nurse" . . . "The Delivery Visit" (a time study) . . . "Twenty-five Years Ago" . . . "An Industrial Nurse Writes Her Annual Report" . . . "Use of Cars by Public Health Nurses" . . . "Twenty Years of Orthopedic Nursing in Boston" . . . "What Pattern—Staff Education?" . . . "Nursing in the Toxemias of Pregnancy."

HEALTH EDUCATION

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Grout, R. E. Rural supervision of health education. Journal of health and physical education (Ann Arbor, Mich.) 8:78–79, 130, February, 1937. Procedures in Cattaraugus county, New York.

Hiscock, I. V. For the enrichment of childhood. Journal of health and physical education (Ann Arbor, Mich.) 8:74–77, February, 1937. Discusses three phases of a health education program; public health education, school health education, and health education of professional groups.

Jean, S. L. Current developments in school health education. Journal of school health (Buffalo, N. Y.) 7:11, January, 1937. This magazine was formerly School physicians bulletin.

Mikalonis, Mary. Teaching mouth health to children in a private practice. Journal of the American dental hygienists' association (Stratford, Conn.) 11:3–7, January, 1937.

Rice, T. B., M.D. What shall we teach in hygiene? Monthly bulletin, Indiana division of public health (Indianapolis) 40:3–4, January, 1937. Second of a series of articles.

Shiels, T. D., M.B. Aims and methods in health education. Medical officer (London) 57: 87–89, February 27, 1937.

Westfall, M. H. The dental health program in Indiana. Monthly bulletin, Indiana division of public health (Indianapolis) 40:8–9, January, 1937.

WHAT HAS BEEN USED

"Better Health Week." An 8 page program of meetings, movies, exhibitors, etc., in Bronx Borough. Bronx Tuberculosis and Health Committee, 226 East Fordham Road, New York, N. Y.

"Syphilis—and the 'Conspiracy of Silence.'" Folder of 4 pages, each nearly letter size. Inside a double page spread shows a diagram in red and black, titled "Syphilis—A Family Problem." Diagram starts with a telephone call about a family of 7 and a boarder; indicates steps taken with each one of the 8 persons, and the 14 services rendered in relation to the syphilis problem by the A.I.C.P., 105 E. 22d St., New York, N. Y. Closing paragraph of the 2 pages of text says:

> Even those who cannot afford to contribute money to this purpose, can contribute *understanding*; for it is only when the conspiracy of silence is ended, and the facts about syphilis are as widely known as the facts about tuberculosis, that we can except to bring the disease under control.

"Tomorrow's Health Depends Upon Today's Prevention" is the keynote of a mimeographed letter from the University Health Officer to faculty mem-

bers and employees of the University of Illinois. Address Dr. J. Howard Beard, Champaign, Ill.

"You and Your New State District Tuberculosis Hospital." A large page, 8 page pamphlet describing and illustrating 3 new hospitals and the territories they serve. S.C.A.A., 105 E. 22nd St., New York, N. Y.

MAGAZINE ARTICLES

Health information in a magazine has a value quite apart from the effectiveness of what is distributed by a health agency. Even the comparatively limited number of copies of any magazine reaching a community is to be reckoned with by the health educator. All that can be reasonably done to extend the circle of readers is a desirable phase of the local health education program.

We see all too few references in health bulletins to current magazine articles.

"Before and After Forty," by C. H. Mayo, M.D. "Preventive medicine holds great promise for man." A distinguished physician shows what it means to us in our everyday existence. *Rotarian*, 35 E. Wacker Drive, Chicago, Ill. June, 1937. *25 cents.*

"Better Babies: Trend in America is Not to More, But to Healthier Infants." Tells of gadgets and services intended to facilitate the trend. *Literary Digest*, 354 4th Ave., New York, N. Y. May 8, 1937. *10 cents.*

"A Drop To Drink," by Dr. V. G. Heiser. "There's so much water around us that we don't give it much thought. But the guardians of our health do. If it weren't for their quiet labors, there'd be lots fewer of us to read this article." *Colliers*. April 24, 1937.

"Home Accidents Killed More Than Autos in 1936," and how to prevent them is demonstrated in 2 pages of pictures in *Look*, 715 Locust St., Des Moines, Iowa. June 8, 1937. *10 cents.* Something to do something about—and so much easier than some others.

"Warnings for Sun-tan Worshipers." Warnings; limited substitutes. "Sick Brains: Psychiatrists Study Mental Disorders That Afflict Thousands of Americans." "Pied Piper." Mentions "The House Rat" issued by Department of Agriculture; guesses of "rodent census." *Literary Digest*. May 29, 1937. *10 cents.*

"Wheeled Nomads: Health Hazards" ("Trailers frighten state and local sanitation officers"). "Fanged Cure: venom for Snake-bite and Toads for Heart Trouble." "Life's Capsule" (based on paragraph in Rockefeller Foundation report). *Literary Digest*. May 15, 1937. *10 cents.*

"Should My Child's Tonsils Be Removed?" By Dr. H. F. Helmholz. "The answer to a question being asked in many households today." *National Parent-Teachers*, 1201-16th St., N. W., Washington, D. C. June, 1937. *15 cents.*

"Ten Million Straining to Hear" ("Deafness, cruel to victims, is alleviated by new devices"). "New Hope" ("Medical research takes another trench in unceasing war against cancer"). *Literary Digest*. May 29, 1937. *10 cents.*

"Uncle Sam, M.D.," by P. A. Williams. *Nation's Business*, Washington, D. C. May, 1937. Reprint *free* from Medical Society of State of New York, 2 E. 103d St., New York, N. Y. The "other" side of compulsory health insurance.

BOOKS AND REPORTS

The Environment and Its Effect Upon Man—*By the Harvard School of Public Health. Boston,* 1937. 297 pp. Price, $3.50.

Man's environment is a subject for philosophers and political economists, and forms the core of all public health study. The present volume is an effort to correlate a few of the many aspects of the subject. It is a compilation of the papers presented at the symposium held at the Harvard School of Public Health, August 24–29, 1936, as a part of the Harvard University Tercentenary Celebration.

Nineteen papers are presented, chiefly by the staff of the School of Public Health, but also several others. The subjects comprise: The effects of social environment, industrial fatigue, air-borne infection, heat and humidity, abnormal air conditions in industry, high pressures, industrial operations in compressed air, carbon monoxide poisoning, toxic organic vapors and gases, dusts and fumes, pneumoconiosis in its various relations, air conditioning in normal life and in hospitals, and the organization and equipment of industrial hygiene laboratories. Except the paper on air-borne infection and its sanitary control, which appeared in *The Journal of the American Medical Association,* all of the papers have been published in *The Journal of Industrial Hygiene and Toxicology.* Illustrations, charts, tables, and extensive bibliographies accompany. An index is omitted but this seems unnecessary in view of the nature of the compilation and the Table of Contents.

The volume makes available a very handy source of access to these valuable papers, all compiled by experts in their respective fields and representing our latest thought.

EMERY R. HAYHURST

United States Life Tables, 1930—*Prepared under the supervision of Dr. Joseph A. Hill. Bureau of the Census, U. S. Department of Commerce. Washington: U. S. Government Printing Office,* 1936. 57 pp. Price, $.75.

The new volume of complete life tables will be gratefully received by students of vital statistics, since there have been no complete tables published by the Census Bureau subsequent to those based on the population returns of the 1910 census. There are 26 complete life tables included in the present volume, 6 of which are reprints of tables number 8 to 12, prepared by Professor Glover, giving the life table functions for white males and for white females in the original Registration States, based on reported deaths for the years 1900 to 1902, 1901 to 1910, and 1909 to 1911. The 20 new tables are specific for both color and sex, 16 of them giving the life table functions for each of the 4 color-sex groups in Continental United States, based on the mortality of 1929 to 1931, and in the 1920 Registration States based on the mortality of 1919 to 1921, 1920 to 1929, and 1929 to 1931. Two further tables give the mortality for white males and for white females in the original Registration

States, 1929 to 1931, thus premitting a comparison with the tables quoted from Glover, which are for the same population groups at earlier dates. The last 2 complete tables show the mortality, exclusive of deaths from tuberculosis, for white males and white females in the Registration States for 1920, in the years 1920 to 1929.

The tables just listed tabulate the life table functions for each year of age, but the 8 tables relating to the original Registration States are further expanded by a tabulation of the functions for monthly subdivisions of the first year of life, the 2 most recent tables subdividing the first month into still finer divisions.

It is not necessary to point out to those who are acquainted with Glover's Tables, and Miss Foudray's Abridged Life Tables of 1920, the great utility of this new volume. The fact that, like the 1910 tables, the functions are tabulated for each year of age, makes them especially valuable. Two features of these earlier publications of the Census Bureau will, however, be missed in this latest volume, one being the raw data on which the life tables were based, and the other a description of the procedure by which the life table functions were derived from the raw data. The former omission is especially regrettable since the Registration Area was not complete in 1930 and the mortality figures are partly estimated.

The procedures used in preparing the tables were selected or devised by Miss Foudray of the Census Bureau, and reviewed by Professor Glover. It would be of interest to have them outlined, particularly for the life tables in which the deaths from tuberculosis are omitted, since various assumptions might be made with regard to the mortality of those now dying from tuberculosis if this cause of death were eliminated. The lack of statement as to what assumption was made leaves the interpretation of the table in some doubt.

The selection of tables to be included seems to be very fortunate for a wide variety of applied problems. It is very much hoped that it will be possible for the Census Bureau to make such tables a routine part of its publication program.

MARGARET MERRELL

Research in Dementia Praecox (Past Attainments, Present Trends and Future Possibilities)—*By Nolan D. C. Lewis, M.D. New York: National Committee for Mental Hygiene,* 1936. 320 pp. Price, $1.50.

It is a mark of progress when a social organization recognizes one of the most serious problems of mankind. This publication was made possible through the aid of the Supreme Council, 33rd° Scottish Rite Masons of the Northern Jurisdiction, U. S. A.

In the introduction—research trends in mental disorder—the difficulties involved in dealing with the field of psychiatry are considered. The complex variables, the lack or impossibility of applying experimental technics, the physiologic and psychologic contrasts are a few factors discussed. Tables are presented to show the numerical distribution of 1,778 papers, monographs, and books in 12 languages during the years of 1920 to 1934.

The clinical features of dementia praecox are described from the historical point of view. For practical purposes the Kraepelinian types are delineated, with emphasis placed upon the need for a new and more comprehensive classification of the praecox group. Some of the directions in which psychology might contribute would be: (1) formulation of the "natural history" of the development of the disorder in the individual, (2)

hallucinations and eidetic imagery, (3) problem of deterioration, (4) application of the Rorschach and Vigotsky technics, and (5) "schizophrenic" language. The future contribution of psychoanalysis to the understanding of the disorder is anticipated. The value that might be derived from studies in the child guidance clinics which deal with problems of early life adjustment is mentioned.

Under etiological aspects, the need to investigate the disorder in primitive peoples is indicated. The epidemiologic method, studies of heredity, race, and the releasing causes are also necessary.

The difficulties in the diagnosis of dementia praecox are discussed with a series of observations to illustrate this. Especial attention is given to the differences between psychoneurosis and dementia praecox and the differential diagnosis of dementia praecox from manic depressive psychosis, paranoia, paranoid dementia praecox, and the hebephrenic types.

Therapy in dementia praecox must be instituted at present on an empirical basis.

In the author's conclusions, he states "mental disorders are created by what might be called a set of external irregularities or 'instabilities' acting upon a set of internal 'instabilities.'" A plan for procedure in psychiatric research is elaborated upon. "A rigid standard of thorough penetrating analyses and carefully considered syntheses" must be maintained.

JOSEPH J. MICHAELS

Feeding Our Children—*By Frank Howard Richardson, M.D. New York: Crowell,* 1937. 159 pp. Price, $1.00.

The complexity of factors entering into the problem of nutrition has made it difficult to express in simple, straightforward terms the practical aspects of this subject. How is the modern mother and housewife to winnow the wheat from the chaff? Dr. Richardson has attempted in brief compass to set forth "a simple and understandable exposition of the principles of nutrition, together with their practical application of the task of planning meals for the various ages." In the main he has succeeded, although in certain parts it is over-simplified for those who would like more basic material. He has followed largely the works of McCollum, Sherman, Holt, Rose, and Peters, to which he gives due credit in his foreword.

The most helpful part of the book from the standpoint of the harassed and perplexed mother should be the chapters applying the principles of nutrition to different age levels. The author reveals a practical knowledge of child psychology, and in his chapter on "when a child refuses to eat," sets forth simple rules which he claims have worked in his practice. There is nothing especially new in the content of this book, although the method of presentation is unique. R. A. BOLT

Second Symposium on Silicosis *(Saranac Lake)—By B. E. Bekuechle, Editor. Wausau, Wis.: Employers Mutuals,* 1935. Paper, 194 pp. Price, $3.00.

This report follows the one of similar title issued in 1934. Principal papers were followed by discussions, and these summarized by Dr. Leroy U. Gardner without attempt at verbatim report. Where possible, the discussants were asked to approve the final copy as here published. Avoidance of technical language was attempted.

The principal papers were those by: R. R. Sayers and R. R. Jones, on Etiology of Silicosis; D. E. Cummings, on Dust in Atmosphere, Occupational History, and Administrative Control;

Leroy U. Gardner, on Pathology of Silicosis, and Correlation between Anatomy and X-Ray Appearance; W. S. McCann and N. L. Kaltreider, on Physiology of the Fibrotic Lung; H. K. Kessler, on Clinical Aspects; D. M. Brumfiel, on Census of Cases of Pneumoconiosis in Tuberculosis Sanatoria; E. P. Pendergrass, also H. L. Sampson, on Roentgenological Diagnosis; A. R. Riddell, on The Clinical Picture and Its Importance and Medical Methods in Control; Philip Drinker, on Engineering Methods in Control; and A. J. Lanza, on Silicosis as a Social Problem.

There is a wide range of compact thought in this volume, both in the findings and opinions of leading specialists, and the discussions which they occasioned. Unfortunately the volume is not indexed and it is necessary for the reader to do some intensive work to get at its contents. Some of the papers are sub-headed and there are a number of valuable outlines and charts. That by McCann has several full-paged half-tones of chest roentgenograms. The volume is indispensable to all who are interested in the subject of silicosis. EMERY R. HAYHURST

Memoranda of Toxicology—*By M. Trumper. (3rd ed.) Philadelphia: Blakiston.* 304 pp. Price, $2.00.

A brief summary of the toxic effects, treatment and detection of various poisonous substances. The author has condensed the subject to a few paragraphs on each poison in such a manner that it should prove valuable to the practising physician in an emergency. It is not a scientific treatise but contains the essential facts saving the doctor the trouble of going through the literature. The book although small in size compares favorably in the given facts with some of the newer and larger volumes on the same subject.

FREDERICK B. FLINN

The Sanitarian and His Duties—*By Grace L. Loye, M.S. Foreword by K. F. Meyer, Ph.D. Ann Arbor, Mich.: Edwards Brothers, Inc.,* 1937. 200 pp. Price, $1.00.

This analysis of inspectional duties in the fields of health and sanitation, together with suggestions as to requirements of sanitary inspectors formed the basis of a dissertation by the author in the Department of Public Administration of the University of Southern California. The volume aims to stimulate improvement in services, to aid in the formulation of qualifications and standards, and to serve as a foundation for future studies in this field. If the volume merely attracts attention to some of the complexities of the present problems of service and training, it will serve a useful purpose—but it is anticipated that this contribution will gain the interest of teachers, health officials, and members of committees who are attempting to define the scope of the sanitary officer's position and his qualifications, and to provide practical training opportunities.

An introductory chapter outlines effectively the development of inspectional services and emphasizes the need of more consideration of the problem.

One of the principal conclusions which forces itself upon investigators in this field is the serious need for adequate standards. Those standards which do exist arose mainly in response to local needs and out of custom and usage. There is, however, no adequate standardization of inspectional procedure or objectives, with the result that both the public and governmental officials are uninformed concerning inspectional activities. The inspectors in the main, create their own standards of inspection, restricted only by departmental rules and policies. This obviously makes for great variance in inspectional methods and procedures and undoubtedly has a deleterious effect on the morale of the inspector, for, without standards to guide him, he tends to become more or less indifferent and lax in the performance of his duties. . . . Perhaps the greatest need of inspectors, however, is adequate training. . . .

The untrained layman or political appointee is no longer able to execute these duties properly.

It is observed that the need for adequate inspectional standards is felt keenly by the inspectors themselves.

The analysis is developed on a unit basis, an attempt being made to include in outline form the essential features of inspection in each unit. For example, under the unit of Housing are presented three major type situations with several sub-headings. In parallel columns opposite these situations are listed items of required information. This material dealing with the knowledge and abilities required of sanitary inspectors under "Required Information" is sub-divided into "Technical" and "Auxiliary." The content is further classified under specific titles, such as science, laws and regulations, forms and records, finance, safety measures, and public relations. While there will be some difference of opinion regarding the details of this classification and the suggestions as to the information which an inspector should possess, the author has made a valuable contribution to the analysis of this phase of public health administration.

IRA V. HISCOCK

Life and Death: The Autobiography of a Surgeon—*By Andrea Majocchi. New York: Knight Publications,* 1937. 300 pp. Price, $2.75.

This extremely interesting book is written by a man who has the reputation of being Italy's foremost surgeon. It is the story of a man who is evidently brilliant, a student, and a humanitarian. Sincere autobiographies, even by less noted persons, are always interesting and valuable. We have found this book above the average of its class. It is particularly interesting to pathologists and bacteriologists to read that the author was a classmate of Negri, who discovered the bodies in rabies known by his name and which are universally used for rapid diagnosis.

We are naturally interested in his observations of America—all the way from the Chicago slaughter-houses to the surgical clinic at Rochester, in which he finds certain American ideas and methods which are similar! He admired the vast strides made in this country in operative technic. He found many brilliant operators but few outstanding clinicians. American surgeons are noted for their skill; the operating rooms perfect, and the work admirably distributed, but he "left this land of miracles without much regret." He found the cities totally lacking in artistic interest and lacking in the warmth of his "beloved Europe—and Italy."

He speaks of nurses as guardian angels and pays them the highest tribute. Of American nurses he says they are practical rather than idealistic; that they have created a definite type which is a salient feature of surgical hospitals. They are recruited from the well-to-do and cultured, not from the lower classes. They are required to have a general cultural background as well as a good medical education. He has elsewhere written at length of the admirable discipline of our nursing schools and holds that the American nurse has a culture and practical value which is definitely outstanding.

A most interesting chapter is devoted to the so-called miracles at Lourdes, where he went one season as physician to a large group of Italian pilgrims. His story of this visit is thrilling as an adventure. He is a devout believer, we may suppose—at least he was not antagonistic in his observations. His whole life shows him to be most human and most sympathetic, and among his charges on this memorable visit were some who enlisted his sympathies to the utmost, yet he ends with these words: "All these

people, who had gone to Lourdes to be cured, had made sacrifices, and had undergone agonizing pain because of the inconveniences of the traveling, without obtaining the slightest alleviation of their misery. Yet they returned home resigned, comforted, serene. Not a word of discouragement, not an accent of rebellion."

The last chapters are devoted to thoughts of old age, and the inevitable end. The "icy" thought of death often assails him. He forgets it by work and devotion to the sufferings of the ill and unfortunate. "What a godsend work is to the man who is growing old!" he says. He asks what the aim of life is, why there should be suffering, why war with its terrible battles, suffering, and death. He reviews his life, finds that often he could have done better, and concludes that during his last years of activity he must multiply his good deeds and do more efficient work than he has ever done before. His dying prayer will be the words which he had engraved on his mother's tomb: *"In te, Domine, speravi, non confundar in aeternum!"*

This is a delightful book, much more than something to be taken up during an idle hour.

MAZŸCK P. RAVENEL

Official and Tentative Methods of Analysis—*By W. W. Skinner, Chairman Editorial Board, Assisted by a Committee of the Association of Official Agricultural Chemists.* (4th ed., 1935). Washington, 1936. 710 pp. Price, $5.00.

This association includes officials of state departments of agriculture, state agricultural colleges and experiment stations, the U. S. Department of Agriculture and the federal, state and city offices charged with the enforcement of food, feed, drug, fertilizer, insecticide, and fungicide control laws. Founded in Philadelphia in 1884, it has continued active through the years in perfecting and adopting methods of analysis useful in this control work.

Beginning with the first edition of the *Methods of Analysis* issued in 1920, these tentative and official methods which were previously published in the *Journal* of the Association have appeared in 4 successive volumes.

The present volume has increased in size over the 417 pages of the 1st edition to 710 pages. While 41 chapters on methods are indicated, the places of 6 of these are marked with an asterisk as they are to include methods which the association has only begun to prepare or plans to prepare. These 6 chapters are to cover sewage, agricultural dust, fish and other marine products, vitamins, bacteriological and microchemical methods.

The remaining chapters cover the methods usually included in the report: soils, fertilizers, agricultural liming materials, insecticides, fungicides, caustic poisons, naval stores, paints, varnishes, leathers, tanning materials, plants, non-alcoholic beverages and concentrates, malt beverages and brewing materials, wines, distilled liquors, baking powders, coffee, tea, cacao bean and products, cereal foods, coloring matters in foods, dairy products, eggs and egg products, flavoring extracts, fruits and fruit products, grain and stock feeds, meat and meat products, metals in foods, nuts and nut products, oils, fats and waxes, preservatives and artificial sweeteners, spices and condiments, sugars and sugar products, vegetables and vegetable products, waters, brine and salt, radioactivity, and drugs. The chapters covering fibers, paper and paper materials which appeared in the 3rd edition are, however, no longer included. Reference tables are included as in previous editions, and, in addition, two useful appendices. The first of these presents methods for the preparation and standardization of

solutions and the second includes a revised and enlarged section on definitions of terms, and interpretation of results on fertilizers and liming materials.

The chapter on dairy products of this report has been used as the basis for the Chemical Methods of Analyzing Dairy Products which forms part of the report previously known as Standard Methods of Milk Analysis issued by the American Public Health Association. They are to be used again in the 7th edition of this well known report now in process of preparation. A description of the standard A.P.H.A. procedure for determining sediment in milk and cream is included (p. 275).

The care taken in testing these methods before they are approved and the clarity with which they are presented has given this report a reputation and standing in laboratories and in the courts that is unexcelled. For this reason this report should be available in every public health laboratory that may be called upon to make analyses of any of the products or materials for which methods are given.

ROBERT S. BREED

Our Children in a Changing World—*By Irwin Wexburg, M.D. with Henry E. Fritch. New York: Macmillan,* 1937. 232 pp. Price, $2.00.

The authors of this book have rendered a significant service to all those interested in the general and specific problems of maladjusted children. The easy reading style, the large number of specific case references, and the arrangement of content make for enjoyable and profitable reading not only by the intelligent lay person but also by the physician, psychologist, psychiatrist, social worker, and teacher.

Following an introduction which pays tribute to the unique contributions of Alfred Adler's individual psychology which permeates the genetic-dynamic methodology of presentation in this book, we find the book divided into 3 parts: Part I concerns itself with the development of the personality and 5 factors of environment—physical, social and economic, sex, family constellation, and education. Part II deals with special problems such as the criminal child, those maladjusted by virtue of lying, over-ambition, the " model child," timidity, selfishness, laziness, and the stupid child. A section is devoted to bad habits and nervous symptoms such as eating difficulties, thumb sucking, nail biting, tics, restlessness, disturbances of speech, bed wetting and uncleanliness, and sexual misbehavior. Part III is devoted to education and corrective measures.

The soundness of the content of this book is unquestionable, buttressed by actual experience, and the interpretation and handling of varying degrees of child maladjustments. The keen insight as well as philosophic approach which give breadth to the understanding and direction of problem behavior are commendable.

The book is rounded out by a well chosen Index. The fresh, crisp manner of style, and particularly the common sense interpretations which take root in critical experience should strongly appeal to all those who are desirous of obtaining a better working knowledge of the multiplicity of problem behavior of childhood.

FREDERICK L. PATRY

The Mentally Ill in America: A history of their care and treatment from Colonial times—*By Albert Deutsch. With an introduction by William A. White, M.D., Sc.D. Garden City, N. Y.: Doubleday, Doran,* 1937. 530 pp. Price, $3.00.

With growing recognition that mental and emotional problems form an essential and very important part of the public health program, this book

should be of vital interest to all health workers.

Deutsch has given us an admirable picture of the development through the centuries of a sound community attitude toward such problems. As in most fields of scientific thought, certain Greek writers took a thoroughly constructive view of mental disease while throughout the Middle Ages this viewpoint was forgotten. In this volume we see the more recent beginnings of a scientific and humane attitude in Benjamin Rush, carried forward by Dorothea Dix, and at last finding its fruition 30 years ago under the stimulus of Clifford Beers.

We note many changing attitudes during the last century and a half. The pendulum swings back and forth between extravagant optimism with claims of 100 per cent cures of the mentally ill and indefinite perfectability of the feebleminded to black pessimism in which the menace of increasing mental disease overshadows the future of the human race. Gradually science and humanity make a slow but sure advance, reaching their peak (for the moment) in the best institutions of today and in the development of a comprehensive but sane program for community mental hygiene. Such a scholarly review as this has long been needed and it will form part of all our thinking in regard to the vital public health problems with which it deals.

C.-E. A. WINSLOW

BOOKS RECEIVED

A TEXTBOOK OF APPLIED BIOCHEMISTRY FOR PHARMACISTS AND PHARMACEUTICAL STUDENTS. By Frank Wokes. Baltimore: Wood, 1937. 522 pp. Price, $5.00.

FEDERAL AND STATE CONTROL OF MILK PRICES. By James A. Tobey. Chicago: International Association of Milk Dealers, 1937. 42 pp. Price, $2.00.

PUBLIC MEDICAL SERVICES. A Survey of Tax-Supported Medical Care in the United States. By Michael M. Davis. Chicago: University of Chicago Press, 1937. 170 pp. Price, $1.50.

EVERYDAY FIRST AID. By Walter Frank Cobb. New York: Appleton-Century, 1937. 269 pp. Price, $1.50.

SAFETY THROUGH CHILDBIRTH. A Guide for the Expectant Mother. By A. J. Rongy. New York: Emerson, 1937. 192 pp. Price, $2.00.

CHILDBIRTH YESTERDAY AND TODAY. The Story of Childbirth Through the Ages to the Present. New York: Emerson, 1937. 192 pp. Price, $2.00.

LEARNING TO BE GOOD PARENTS. Talks to Fathers and Mothers. By Eleanor Saltzman. Boston: Manthrone & Burack, 1937. 55 pp. Price, $.25.

BACTERIOLOGY. A Textbook of Microorganisms. By Fred W. Tanner. 3d ed. New York: Wiley, 1937. 510 pp. Price, $3.50.

TAKE CARE OF YOURSELF. A Practical Guide to Health and Beauty. New York: Simon & Schuster, 1937. 287 pp. Price, $2.00.

HEALTH EDUCATION OF THE PUBLIC. A Practical Manual of Technic. By W. W. Bauer and Thomas G. Hull. Philadelphia: Saunders, 1937. 227 pp. Price, $2.50.

AMERICAN RED CROSS LIFE SAVING AND WATER SAFETY. Prepared by the American Red Cross. Philadelphia: Blakiston. 267 pp. Price, $.60.

A FIVE-YEAR STUDY OF TUBERCULOSIS AMONG NEGROES. New York: National Tuberculosis Association, 1937. 77 pp. Price, $.50.

DIGEST OF TREATMENT. Volume 1, Number 1. July, 1937. George E. Rehberger, General. Editorial Adviser. Philadelphia: Lippincott, 1937. Subscription, U. S. A., $5.00, Canada, $5.50, Foreign, $6.00.

HEALTH IN COLLEGES. Report of the Second National Conference on College Hygiene, Washington, D. C., Dec. 28–31, 1936. New York: National Tuberculosis Association, 1937. 128 pp. Price, $1.00.

FOOD TECHNOLOGY. By Samuel C. Prescott, Sc.D., and Bernard E. Proctor, Ph.D. New York: McGraw-Hill, 1937. 630 pp. Price, $5.00.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Diphtheria Experience in 1936—Among the large cities, fewer had excessive death rates from diphtheria than a year ago, but the number that had none remained the same. Where general immunization was approached, there the rates were lower.

ANON. Diphtheria Mortality in Large Cities of the United States in 1936. J.A.M.A. 108, 26:2200 (June 26), 1937.

Current Typhoid Fever Deaths—Again the large cities report a reduction in typhoid fever mortality rates. In the South, persistence of typhoid in rural regions materially handicaps the cities. There the rates are highest; they are lowest in the Atlantic seaboard and New England states.

ANON. Typhoid in the Large Cities of the United States in 1936. J.A.M.A. 108, 25: 2118 (June 19), 1937.

Poliomyelitis Among Nurses—A study of nurses who contracted poliomyelitis in Los Angeles, considers the care and treatment needed, their eligibility for Workmen's Compensation, and the after-effects reported. Recommendations regarding the selection and protection of nursing personnel in epidemics are given.

ANON. Results of Poliomyelitis Among Nurses. Am. J. Nurs. 37, 6:620 (June), 1937.

Nasal Immunization—Editorializing upon the Danish report of the successful immunization of children against diphtheria with intranasal instillations of alum-toxoid, this British paper asks for more experiments with the method.

ANON. New Methods of Immunization Against Diphtheria. Lancet. 1, 16:934 (Apr. 17), 1937.

Psychiatry and Sociology—In the interest of clarifying the relationship between psychiatry and sociology, the Editor of the American Journal of Sociology has devoted an issue to a symposium on the psychiatric interpretation of human society, with contributions by 7 psychiatrists, representing different points of view, a cultural anthropologist, and a social psychologist.

ADLER, A., *et al.* Symposium: The Contribution of Psychiatry to the Understanding of Human Society. Am. J. Soc. 42, 6:773 (May), 1937.

Where Venereal Disease Is Disappearing—Enthusiastic reports are made about the "liquidation" of prostitution in Russia resulting, so it is said, from these factors: women work on equal terms with men; labor is in great demand; divorce is facilitated; prophylactoria take care of the few remaining prostitutes; and enthusiasm for the national cause has changed sex behavior. Fine, if true.

CULVER, E. H. An Experiment in Social Hygiene. Brit. M. J. 3986:1120 (May 29), 1937.

Rats—Some absorbing action photographs of rats making improperly set hawser rat-guards look silly. Interesting to sanitarians ashore as well as afloat because they suggest what a determined rat really can do.

DENNY, O. E. Some Experiments with Rats and Rat Guards. Pub. Health Rep. 52, 23:723 (June 4), 1937.

Public Health Nursing for Crippled Children—A comprehensive description of the duties of the public health nurse in her service to crippled children, this paper explains the prepa-

ration needed in order to perform such service adequately, and lists the schools which have accredited courses for physical therapy technicians which conform to the standards adopted by the A.M.A. in 1936.

DEUTSCH, N. The Rôle of the Public Health Nurse in Services for Crippled Children. Pub. Health Nurs. 29, 6:350 (June), 1937.

Old Man River—What caused the weather, the rain resulting from the weather, the damage the water did, and some partially preventive measures are all discussed by men who should know most about this important, interesting, and difficult subject.

DEVEREAUX, W. C. Precipitation, River Stages, and Forecasts in the Ohio River Flood of 1937.

POHL, H. H. Ohio River Flood Control Plan.

BROSSMANN. Flood Protection in the Ohio Valley. American Journal Water Works Association. 29, 5:581 (May), 1937.

Cleaning Shell Fish—How oysters and mussels from polluted beds are rendered safe with chlorin treatment is described in this British journal. Oyster enthusiasts will bridle at the statement "it may be taken as an admitted fact that shellfish are, at best, a dirty and not infrequently a dangerous food." Perish the thought!

DODGSON, R. W. Shellfish and the Public Health. Pub. Health. 50, 9:279 (June), 1937.

Urging Pasteurization of Milk—Displaying statistics that indicate no significant decrease in the number of milk-borne outbreaks of communicable disease in the last 10 years (because most outbreaks occur in small communities where milk supplies are not conveniently pasteurized), the advantages of safe milk are reviewed.

FRANK, L. C. Pasteurization, the Indispensable Safeguard. Month. Bull., New Haven Department of Health. 44, 6:2 (June), 1937.

Poisoning from Foods—Custard cake filling is reported again as the source of a food poisoning epidemic. It seems time to do something about this in a big way. Canned antipasto, too, made a Thanksgiving feast hideous.

GEIGER, J. C. Report of Two Outbreaks of Food Poisoning. Pub. Health Rep. 52, 24:765 (June 11), 1937.

Visiting Housekeepers—An evaluation of the benefits rendered by a New York housekeeper service would lead one to believe that it has an indispensable part to play in modern health administration and social work. This is an extremely interesting, detailed account of the valuable work done by one organization. Health workers who read the article will wish that this service were available in many more communities.

HICKS, L. T. Evaluating the Visiting Housekeeper. The Family. 18, 4:124 (June), 1937.

Is the Private Relief-Giving Agency Needed?—The U. S. Children's Bureau summary of urban relief statistics, 1929–1935, showed that in 1929 private funds supplied 23.5 per cent of the total family relief in large cities: by 1935 the amount had decreased to only 1.4 per cent. The author discusses the need for the private agency in the realm of relief-giving. His conclusions are that for the present there is much need for this supplementary relief service and that the need is likely to continue. Health workers will be interested in the analogy of these findings to the field of public health.

HURLIN, R. G. Relief in Private Family Agencies in the Post-Depression Period. The Family. 18, 4:121 (June), 1937.

Too Late?—Plotting the age of authors at the time their best books were written (usually before age 45) and sampling the time lag between

writing and publication, the conclusion is reached that best books are written while the authors are still in their 30's. This will be bad news to graying sanitarians who still harbor the secret desire to write that masterpiece.

LEHMAN, H. C. The Creative Years: "Best Books." Sci. Month. 45, 1:65 (July), 1937.

Regional Death Rates—Though this paper concludes that regional mortality studies of tuberculosis, cancer, appendicitis, and typhoid fever are not satisfactorily explicable, the presentation will give sanitarians much food for speculation.

LUMSDEN, L. L., and DAUER, C. C. Geographical Distributions of Mortality from Tuberculosis, Cancer, Appendicitis, and Typhoid Fever in the White Population of the United States. Pub. Health Rep. 52, 25:791 (June 18), 1937.

New York and Mental Health—One out of every 18 persons in New York City may expect to be treated in an institution for mental diseases some time during life, says this author. He doesn't suggest that it is the city life that is responsible, but the rate is considerably lower in up-state New York. Every non-resident will do his own conclusion-jumping.

MALZBERG, B. The Expectancy of Mental Disease in New York City in 1930. Mental Hyg. 21, 2:280 (Apr.), 1937.

Annual Nursing Salary Study—In 1925 the N.O.P.H.N. began its study of salaries paid to public health nurses in the United States and each year since has issued a report. The study is divided into the following items: staff salaries by size of city, type of organization (public or private), size of staff, geographic section of the country; supervisors, assistant directors and directors; and salaries of school nurses. On the whole, salaries seem to be rising. Every executive should find this study of interest.

MILLER, A. J. Salaries of Public Health Nurses in 1937. Pub. Health Nurs. 29, 6:368 (June), 1937.

Cause of Maternal Deaths—What to do about the 4 great impediments to maternal health, poverty, ignorance, unwillingness to bear children, and disease, is discussed briefly and ably.

PARRAN, T., JR. Impediments to Maternal Health. Pub. Health Nurs. 29, 6:347 (June), 1937.

Not Very Healthy, Thank You—Some of the findings of the recent national health inventory are reduced to dramatic statistical charts. Should be read by all as an introduction to the detailed reports to follow.

ROSS, M. How Healthy Are We? Graphic. 26, 7:371 (July), 1937.

Frontier Nursing Service Time Studies—For nurse midwives who serve an isolated, rural area and whose mode of travel is by horse, distribution of time must differ from that of nurses who work in congested urban areas. The Frontier Nursing Service time study shows 26.8 per cent of the time is spent in travel and caring for the horses; 26 per cent goes into midwifery, including prenatal, delivery, and postpartum care; general public health nursing in home and clinic consumes 13.6 per cent; sickness nursing 3.2 per cent; record and office work 16.3 per cent.

WILLEFORD, M. B., and ROSS, M. S. How the Frontier Nurse Spends Her Time. Quart. Bull., Frontier Nursing Service. 12, 4:3 (Spring), 1937.

Insects and Fevers—Reservoirs for the rickettsia infections, originally diseases of insects and now transmitted to man and animals by ticks, mites, lice, and fleas, are shown in world maps. Possible preventive measures are discussed.

ZINSSER, H. The Rickettsia Diseases. Am. J. Hyg. 25, 3:430 (May), 1937.

ASSOCIATION NEWS

SIXTY-SIXTH ANNUAL MEETING
AMERICAN PUBLIC HEALTH ASSOCIATION

New York, N. Y.
October 5–8, 1937

NEW YORK THE ANNUAL MEETING CITY

THAT New York should become the convention capital of the world is wholly a natural development. The new world lavishly conferred its treasures upon the municipality. It became the metropolis of a mighty nation and, ultimately the most breath-taking city in existence. Through all this magic growth the city remained unspoiled, a neighbor to the cities of the earth, wherefore it was inevitable that New York should grow into a paradise for visitors.

The shade of the venturesome Hendrik Hudson on viewing the rooftops of Manhattan in 1937 would exclaim indignantly, " I don't believe it." Should he slip into the observation tower of Empire State Building, 1,040 feet above the fairyland which is Manhattan by night, a wisp of cloud at his elbow, or should he stroll about the roof of the R. C. A. Building in the Rockefeller Center not far distant, doubtless he would dismiss it all as the fantastic trick of an overwrought imagination. For so it would seem and so it does seem at times to the descendants of Hendrik Hudson. Hudson rode into New York harbor on the quarterdeck of a 90 ton shallop on a voyage of discovery for which he had been paid $320. It was stipulated by his backers on this first Atlantic crossing that his widow would receive an additional $80 in cash should he fail to return. Today his countrymen " commute " to America on superliners beside which the shallop would appear a row boat.

First known as New Amsterdam, New York in 1628 had 270 inhabitants. Within 15 years 18 languages were spoken in the town. In 1653 the municipal government was similar to that of Holland cities. Then, in 1664 the Duke of York sent out an English fleet to capture New Amsterdam and this being done bloodlessly the town was named New York after its captor.

Greater New York of today, the product of unlimited transportation facilities and of the growth of America, covers 320.03 square miles or 201,659 acres as indicated by the Topographical Bureau. As computed by the federal government the incorporated city covers 191,360 land acres as compared with 125,430 acres in Chicago and 81,920 acres in Philadelphia. The visitor gives most of his thought to the Borough of Manhattan which has an area of 21.9 square miles, about one-tenth the size of Chicago.

The City of New York is divided

into five boroughs—Manhattan, Brooklyn, The Bronx, Queens, and Richmond —whose limits are coterminous respectively with the counties of New York, Kings, Bronx, Queens, and Richmond. Each of the boroughs elects a borough president who is in a sense a local mayor. The Borough of Manhattan comprises, along with several small islands adjacent, the Island of Manhattan which lies between the Hudson River on the west and the East River or channel connecting Long Island Sound and New York Bay. Spuyten Duyvil Creek and Harlem River separate Manhattan Island from the mainland on the North and Northeast.

Manhattan, the residential, commercial, and financial center of the metropolis, is 13½ miles long, its maximum width being 2¼ miles at 14th Street. The northern and southern extremities are only a few hundred yards wide. Along the waterfront are 32 miles of dockage facilities available for commercial purposes. Prior to 1847 the city limits did not extend beyond Manhattan.

Upon the solid rock that is largely Manhattan's easy chair, a city has been building whose spires pierce the clouds —when there are any clouds to pierce. Here is a city of countless wonders, a city to which the civilized world has contributed lavishly, and whose attractions are so great that they draw visitors from all points of the compass.

Members of the American Public Health Association and their families and friends will find many things of special interest in and about New York City. At the Civic Center near the City Hall is located the building housing the Departments of Health and Hospitals where Commissioners John L. Rice and S. S. Goldwater have their executive offices.

At Rosebank, Staten Island, is located the Quarantine Station of the U. S. Public Health Service, although within recent months a new arrangement has been put into effect whereby passenger ships having ships' doctors are permitted to proceed to their piers direct if the ship's physician certifies by radio to the government officials that there is no communicable disease on board. Nevertheless, the station is maintained at Rosebank for all other types of ships and is an active branch of the U. S. Public Health Service. Interestingly enough, one of the steamboats which carried the physicians of the Inspection Service is named William H. Welch.

Not far from the headquarters hotel is one of the new District Health Centers located at Ninth Avenue and 27th Street and serving the district known as the Lower West Side. Here will be found a district health officer representing the Commissioner and having under his jurisdiction clinics for tuberculosis, venereal diseases, and eye diseases, as well as prenatal and well baby clinics. Here also will be found branch offices of the Henry Street Visiting Nurse Service, Health Education Services of the Department of Health, and an auditorium for community meetings. Auxiliary to the Health Center is a Medical Advisory Committee made up of physicians in the district and a district health committee made up of local key persons coöperating with the Health Officer in interpreting the work of the Center to the area it serves.

Hospital of special interest to visitors are the Columbia-Presbyterian Medical Center at Broadway and 168th Street. This Center is a combination of the Presbyterian Hospital, the Sloane Hospital for Women, the Vanderbilt Clinic, the Presbyterian Hospital School of Nursing, Columbia University College of Physicians and Surgeons, School of Dental and Oral Surgery, School of Oral Surgery, Babies Hospital, Neurological Institute and

the State Psychiatric Institute and Hospital.

The New York Hospital at York Avenue, 68th Street and East River, includes in its group Cornell University Medical College, Lying-In Hospital, Manhattan Maternity and Dispensary, Nursery and Child's Hospital and Payne Whitney Psychiatric Clinic. Both the Columbia-Presbyterian and New York Hospital groups are easily accessible from the Headquarters Hotel.

NOMINATIONS FOR THE GOVERNING COUNCIL

IN accordance with the By-laws of the Association, the Nominating Committee reports the following nominations for the Governing Council. The Constitution provides that " upon the petition of twenty-five Fellows, the Nominating Committee shall add the name of any Fellow to this list, providing such petition is received fifteen days before the Annual Meeting."

The ten Fellows receiving the highest number of votes on a written ballot cast by the Fellows present and voting at the Annual Meeting in New York City will be elected for the three year term 1937–1940.

M. E. Barnes, M.D., Dr.P.H.
State University of Iowa,
Iowa City, Ia.

Robert E. Chaddock, Ph.D.
Columbia University,
New York, N. Y.

Selwyn D. Collins, Ph.D.
National Institute of Health,
Washington, D. C.

Joel I. Connolly
Board of Health,
Chicago, Ill.

C. M. Derryberry, Ph.D.
U. S. Public Health Service,
Washington, D. C.

Laura A. Draper, R.N.
Community Health Service,
Minneapolis, Minn.

W. F. Draper, M.D.
U. S. Public Health Service,
Washington, D. C.

Gordon M. Fair
Harvard University,
Cambridge, Mass.

A. Grant Fleming, M.D., D.P.H.
McGill University,
Montreal, Que.

Arthur E. Gorman
Department of Public Works,
Chicago, Ill.

Ira V. Hiscock
Yale University,
New Haven, Conn.

Harold J. Knapp, M.D.
Commissioner of Health,
Cleveland, O.

A. J. Lanza, M.D.
Metropolitan Life Insurance Company,
New York, N. Y.

E. V. McCollum
Johns Hopkins University,
Baltimore, Md.

K. F. Meyer, Ph.D., M.D.
University of California,
San Francisco, Calif.

William B. Palmer
Milk Inspection Association of the Oranges and Maplewood,
Orange, N. J.

J. T. Phair, M.B., D.P.H.
Provincial Department of Health,
Toronto, Ont.

Lowell J. Reed, Ph.D.
Johns Hopkins University,
Baltimore, Md.

John L. Rice, M.D.
Commissioner of Health,
New York, N. Y.

George C. Ruhland, M.D.
Health Officer,
Washington, D. C.

William A. Sawyer, M.D.
Eastman Kodak Company,
Rochester, N. Y.

Clarence D. Selby
General Motors Corporation,
Detroit, Mich.

William P. Shepard, M.D.
Metropolitan Life Insurance Company,
San Francisco, Calif.

W. G. Smillie, M.D.
Harvard University,
Boston, Mass.

Raymond V. Stone, D.V.M.
Los Angeles County Health Department,
Los Angeles, Calif.

William D. Stovall, M.D.
State Laboratory of Hygiene,
Madison, Wis.

L. R. Thompson, M.D.
National Institute of Health,
Washington, D. C.

Augustus B. Wadsworth, M.D.
State Department of Health,
Albany, N. Y.

Huntington Williams, M.D.
Commissioner of Health,
Baltimore, Md.

C. C. Young, D.P.H.
State Department of Health Laboratory,
Lansing, Mich.

APPLICANTS FOR FELLOWSHIP

IN accordance with the By-laws of the Association, the names of applicants for Fellowship are officially published herewith. They have requested affiliation with the Sections indicated. Action by the various Section Councils, the Committee on Fellowship and Membership, and the Governing Council will take place between now and the time of the New York City Annual Meeting.

Health Officers Section

Harold D. Chope, M.D., M.P.H., Health Officer, Newton, Mass.

D. C. Y. Moore, M.D., Health Officer, Manchester, Conn.

Benjamin M. Primer, M.D., M.P.H., Director, Amarillo Potter County Health Unit, Amarillo, Tex.

Edwin H. Schorer, M.D., Dr.P.H., Director of Health, Kansas City, Mo.

Laboratory Section

Frederick Eberson, M.D., Ph.D., Epidemiologist, Bureau of Communicable Diseases, Health Department, San Francisco, Calif.

Everett S. Sanderson, Ph.D., M.D., Head, Department of Bacteriology & Public Health, Medical School, University of Georgia, Augusta, Ga.

Vital Statistics Section

James F. Blackerby, Director, Bureau of Vital Statistics, State Department of Health, Louisville, Ky.

Alfred J. Lotka, D.Sc., Assistant Statistician, Metropolitan Life Insurance Company, New York, N. Y.

Hugo Muench, M.D., Dr.P.H., Member, Field Staff, International Health Division, Rockefeller Foundation, New York, N. Y.

William R. Tracey, B.A., Chief of Vital Statistics, Dominion Bureau of Statistics, Ottawa, Ont., Canada

Food and Nutrition Section

Callie Mae W. Coons, Ph.D., Associate Food Economist, Bureau of Home Economics, Washington, D. C.

Robert McD. Allen, M.A., President & Chairman of Board, Vegex, Inc., New York, N. Y.

Child Hygiene Section

J. Warren Bell, M.D., Ph.D., Director, Division of Maternal & Child Health, State Department of Health, Lincoln, Neb.

Public Health Education Section

Norman L. Burnette, Asst. Secretary, Welfare Division, Metropolitan Life Insurance Company, Ottawa, Ont., Canada

G. Hamilton-Francis, M.D., Director of Health Education, Norfolk Public Clinic, Norfolk, Va.

Don C. Lyons, D.D.S., M.S., Editor of Dental Section, Joint Committee on Public Health Education, Jackson, Mich.

Public Health Nursing Section

Katherine E. Faville, M.S., Associate Dean & Professor of Public Health Nursing, School of Nursing, Western Reserve University, Cleveland, O.

Margaret G. Arnstein, C.P.H., R.N., Consultant Nurse, Division of Communicable Diseases, State Department of Health, Albany, N. Y.

Mary D. Forbes, B.S., R.N., Regional Public Health Nursing Consultant, U. S. Public Health Service, New York, N. Y.

Dorothy Deming, A.B., R.N., General Director, National Organization for Public Health Nursing, New York, N. Y.

Epidemiology Section

Samuel Frant, M.D., Epidemiologist & Director, Bureau of Preventable Diseases, Department of Health, New York, N. Y.

Unaffiliated

Edward W. Zukauckas, M.D., Medical Inspector, Department of Health, New York, N. Y.

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

Walter I. Akana, M.D., Box 63, Westernville, N. Y., Health Officer

George L. Athey, M.D., Beardstown, Ill., District Health Superintendent

Archie M. Baker, M.D., 307 S. Wellwood Ave., Lindenhurst, N. Y., Health Officer

Robert H. Bell, M.D., Carlinville, Ill., District Health Superintendent

Thomas F. Birmingham, M.D., 505 Bondi Bldg., Galesburg, Ill., District Health Superintendent

R. M. Bissekumer, M.D., 404 Rockford Natl. Bank Bldg., Rockford, Ill., District Health Superintendent

Harry H. Blodgett, M.D., 430 Professional Bldg., Beverly Hills, Calif., Health Officer

Walter H. Bruce, M.D., 114 E. Barraque, Pine Bluff, Ark., Director, Jefferson County Health Dept.

Oliver E. Carson, M.D., 2342 State St., Alton, Ill., District Health Superintendent

Elmer E. Clark, M.D., Oakley, Ill., District Health Superintendent

Marguerite E. Eddy, 52 High St., Jamestown, R. I., Heath Officer

Frank J. Fara, M.D., 5539 W. Cermak Rd., Cicero, Ill., District Health Superintendent

Alford G. Hendrick, M.D., Sylvester, Ga., Worth County Health Commissioner

Leon R. Kramer, D.D.S., State Board of Health, Topeka, Kans., Director, Division of Dental Hygiene

Samuel McK. Lougeay, M.D., 7 S. Church St., Belleville, Ill., District Health Superintendent

John B. Mathis, M.D., Ullin, Ill., District Health Superintendent

Joseph F. Mieczynski, M.D., 911–14 St., N. Chicago, Ill., District Health Superintendent

J. W. Montgomery, M.D., Birds, Ill., District Health Superintendent

Paul D. Moore, M.D., Calhoun, Ky., McLean County Health Officer

James J. O'Hearn, M.D., 5422 W. Quincy St., Chicago, Ill., District Health Superintendent

Harry F. Parker, M.D., State Board of Health, Jefferson City, Mo., State Health Commissioner

Stewart G. Patton, M.D., Court House, Youngstown, O., Mahoning County Health Commissioner

Warren F. Pearce, M.D., 209 Illinois State Bank Bldg., Quincy, Ill., District Health Superintendent

John W. Pennock, M.D., 713 E. Genesee St., Syracuse, N. Y., Health Officer Appointee

Roy L. Pierce, M.D., Morrow County District Board of Health, Mt. Gilead, O., Health Commissioner

Frank J. Pokorney, M.D., 2318 S. Austin Blvd., Cicero, Ill., Health Commissioner

Otto R. Scott, M.D., Chrisman, Ill., District Health Superintendent

Walter P. Scott, M.D., 113 Park Place, Lexington, Ill., District Health Superintendent

Martin H. Skagga, M.D., C.P.H., Maple St., Taylorsville, Ky., Director, Spencer County Health Dept.

Regnar M. Sorensen, M.D., Cherokee, Ia., Director, Health District No. 1

Arthur A. Thieda, M.D., 1301 S. 49 Court, Cicero, Ill., Assistant to Health Commissioner

W. Clarence Van Wormer, M.D., 17842 Dixie Highway, Homewood, Ill., District Health Superintendent

Laboratory Section

Floyd W. Brown, Public Health Laboratory, Topeka, Kans., Acting Bacteriologist in charge

Ralph O. Brown, 9 Franklin St., Attleboro, Mass., Milk Inspector and Bacteriologist, Health Dept.

Oliver W. Lohr, M.D., 504 Janes St., Saginaw, Mich., Laboratory Director, Central Laboratory

Vital Statistics Section

Jo C. Rose, State Health Dept., Oklahoma City, Okla., Statistician

Willy Selleslags, 256 Hudson Ave., Albany, N. Y., Student at present; to organize Division of Vital Statistics, State Dept. of Health in Belgium

Ricardo de Shelly, 1617 N. Broadway, Baltimore, Md., Student at present; Chief of

Service of Statistics, Ministry of Health and Social Assistance in Venezuela

Public Health Engineering Section

Walter E. Casey, C.E., Box 477, Dexter, Mo., Public Health Engineer

George O. Hall, Mellon Institute of Industrial Research, Pittsburgh, Pa., Industrial Fellow

Lloyd R. Setter, Ph.D., New York University, University Heights, N. Y., Instructor in Sanitary Engineering

Juan Valenzuela, Aldama 104, Chihuahua, Mexico, President, Junta de Aguas

Industrial Hygiene Section

Lester E. Judd, M.D., Barre City Hospital, Barre, Vt., Division of Industrial Hygiene, State Dept. of Health

John B. Kistler, M.D., 801 Granger Ave., Ann Arbor, Mich., Assistant Medical Supervisor, Bureau of Industrial Hygiene, State Dept. of Health

Henry N. Parrish, City Health Dept., Memphis, Tenn., Industrial Hygiene Engineer

Food and Nutrition Section

William F. Reindollar, Sc.D., State Dept. of Health, Baltimore, Md., Chief, Bureau of Chemistry

Child Hygiene Section

Jack B. Eason, M.D., State Board of Health, Phoenix, Ariz., Director of Maternal and Child Hygiene

Freda E. Miller, Capitol Bldg., Helena, Mont., Executive Secretary, State Orthopedic Commission

Public Health Education Section

Virginia M. Alexander, M.D., 2104 W. Jefferson, Philadelphia, Pa., Student

Ross P. Marsteller, D.V.M., School of Veterinary Medicine, College Station, Tex., Teacher

Loyce I. Williams, 221 Hermitage Court, San Antonio, Tex., Hygiene Worker, Health Sanitary Project

Public Health Nursing Section

Caroline Tillinghast, R.N., Princeton Hotel, Gainesville, Ga., District Advisory Nurse, State Dept. of Public Health

Epidemiology Section

Emmett E. Sappington, M.D., 25 Glover St., San Francisco, Calif., Epidemiologist, Dept. of Public Health

J. Earl Smith, M.D., 2627 N. Kingshighway, St. Louis, Mo., Epidemiologist, Health Division

T. Noxon Toomey, M.D., State Dept. of Public Health, Springfield, Ill., Assistant Epidemiologist

Unaffiliated

Hyman J. Burstein, M.D., 250 N. Water, Decatur, Ill., Venereal Disease Clinician, State Dept. of Public Health

Joseph M. Curry, 550 Main St., Hartford, Conn., Director, Bureau of Inspection, Board of Health

Fred E. Dargatz, M.D., P. O. Box 767, Kinsley, Kans., Milk and Dairy Inspector

Olin E. Hoffman, D.D.S., 1103 Hull Ave., Des Moines, Ia., Dental Consultant, State Dept. of Health

Frank R. Williams, 1605 E. Culver St., Phoenix, Ariz., Educational Adviser, State Board of Health

DECEASED MEMBERS

E. B. Swerdfeger, M.D., Denver, Colo., Elected Member 1928

Harry G. Timbres, M.D., Baltimore, Md., Elected Member 1935

CITY HEALTH CONSERVATION CONTEST FOR 1937 ANNOUNCED

THE Chamber of Commerce of the United States and the American Public Health Association announced on July 1 the ninth annual City Health Conservation Contest. This Contest now announced for 1937 and its partner, the Rural Health Conservation Contest, are considered to be among the most provocative stimuli of recent date in arousing interest in public health and in initiating preventive and protective community health measures. The City Contest for 1937 might have been announced sooner, as was done in the case of the Rural Contest, were it not that the announcement had to be delayed until there was fairly definite assurance that funds would be available for the carrying out of the competition. These funds are provided by insurance companies. Most of the former supporters have already pledged their support for this year, and by the middle of June, 4 new companies had sent contributions to help finance the Contest, being of the opinion that their contribution was an investment, rather than a donation.

With the development of rural full-time health service, a number of the smaller cities formerly in the City Contest, will be included in the Rural Contest as they are part of the county or district health units; but there are still left plenty of cities with their independent health organization to double or triple the number hitherto participating. It is hoped the response to the announcement will be general, as participation has proved most helpful and will still be so to those taking part in the Contest.

ASSOCIATION OF WOMEN IN PUBLIC HEALTH

THE Association of Women in Public Health will hold its customary open meeting on Wednesday evening, October 6, at the McAlpin Hotel with dinner at 6:30.

The meeting of this Association is coming to be looked upon in larger measure each successive year as the one opportunity afforded women in the various fields of public health to meet informally and with no set purpose aside from that of personal acquaintanceship and the friendly exchange of experience.

All women who are present at the American Public Health Association meetings either as members or friends are invited to attend this meeting, at which dinner will be served at a moderate cost.

NEWS FROM THE FIELD

TEN MILLION FOR CANCER RESEARCH

ESTABLISHMENT of a fund understood to be about $10,000,000, to be used for cancer research, was announced by Yale University. The donor of the fund—which will be the Jane Coffin Childs Memorial Fund for Scientific Research—is stated to be Starling W. Childs, of New York.

This contribution is the largest ever made to Yale for scientific research, President Angell said. It is provided in the deed of gift that if, and when, the cancer problem is solved, the foundation is to devote its time to other unsolved medical problems, or, if its governing body so decides, to unsolved problems in other fields of science.

N.O.P.H.N. FORMS FOR REPORTING SCHOOL HEALTH SERVICE

THE May, 1937, issue of *Public Health Nursing* includes an article which will be of particular interest to those responsible for statistical reports of the school health service. A form is presented for the monthly and annual statistical report of this service. Prior to publication the form was submitted to the A.P.H.A. Subcommittee on Manual of Practice, since it is not limited to public health nursing service, but includes items relative to medical and dental services as well.

Comments and suggestions will be welcomed by the Education Committee of the N.O.P.H.N. School Nursing Section which prepared the form.

PUBLIC HEALTH PROGRESS IN SIAM

A NEW regimen of national hygiene is being attempted in Siam under the direction of Dr. Nai Young Huar, Medical Inspector of Public Health. Dr. Huar graduated from the University of Tennessee College of Medicine in 1924 and received a certificate of public health from Harvard School of Public Health in 1933. Dr. Huar is at present conducting a campaign to improve the dietary of the Siamese, urging them to eat a varied diet instead of a diet consisting mostly of rice. Siam has a plentiful supply of proteins and other foods, but because of ignorance and sometimes questionable ideas, the average inhabitant does not eat them. The budget for health service has been increased.—*J.A.M.A.*, May 29, 1937, p. 1900.

PERSONALS

THOMAS PARRAN, M.D.,* President of the A.P.H.A., and Surgeon General of the U. S. Public Health Service, had conferred on him the Honorary Degree of Doctor of Science by Colgate University, Hamilton, N. Y., on June 14.

EDWARD R. BALDWIN, M.D., of Saranac, N. Y., had conferred on him the Honorary Degree of Doctor of Science by Dartmouth College, Hanover, N. H., in recognition of his contribution to the field of tuberculosis.

EUGENE MCGILLIAM, M.D., was appointed Commissioner of Health of the City of Yonkers on June 16, succeeding L. V. WALDRON, M.D., deceased. Dr. McGilliam, who has practised in Yonkers for a number of

* Fellow A.P.H.A.
† Member A.P.H.A.

years, has been interested in the tuberculosis control program and recently completed the course at the DeLamar Institute of Public Health, Columbia University, College of Physicians and Surgeons.

GAYLORD W. ANDERSON, M.D.,* director of the Division of Communicable Diseases of the Massachusetts Department of Public Health, has been appointed Professor and Head of the Department of Preventive Medicine and Public Health at the University of Minnesota.

DR. JOHN B. ELDERS has been appointed Medical Director of Health District No. 12, with headquarters at Paragould, Ark.

DR. MALVERN B. CLOPTON, of Clarksville, Mo., has been appointed for four years on the Missouri State Board of Health.

DR. JULIO RAYMOND SOLTERO, of Lewistown, Mont., has been appointed Health Officer of Fergus County, succeeding DR. JOHN C. DUNN, of Lewistown, who has become head of the state hospital at Warm Springs.

ALVY N. CRAIN, M.D.,* of Phoenix, Ariz., formerly Director of the Maricopa County Health Unit, has been appointed Director of Local Health Administration of the State Department of Health, succeeding GEORGE A. HAYS, M.D.†

DR. CHARLES G. BAKER, of Louisville, Ky., has been appointed Health Officer of Fulton County, to succeed GRADIE R. ROWNTREE, M.D., C.P.H.,† of Hickman, who has been appointed Assistant Health Officer of Louisville.

DR. JAMES C. HANCOCK, recently in the Indian Medical Service at Fort Apache, Ariz., has been made Health Officer of Hickman County, Ky.

JOSEPH J. GERKINS, M.D.,† of Bedford, Ky., has been appointed Health Officer of Fleming County, to succeed CHADWICK W. CHRISTINE, M.D.,† of Flemingsburg, who resigned to accept a similar position in Jefferson County.

DR. PIERCE A. STEELE has been appointed Health Officer of Decatur, Ill., succeeding WILMIER M. TALBERT, M.D.,† resigned.

DWIGHT O'HARA, M.D.,† Professor of Preventive Medicine, Tufts College Medical School, Medford, Mass., has been appointed Vice-Dean, a newly created position, to supervise clinical instruction during the third and fourth years. He will continue as Professor.

RUTHERFORD B. H. GRADWOHL, M.D.,† has resigned as Director of the Laboratory and member of the pathology and bacteriology staffs of the St. Louis County Hospital, St. Louis, Mo. He is succeeded by DR. HOLLIS N. ALLEN.

DR. LON M. TILLMAN, of Kansas City, Mo., has been appointed on the Commission of Nine to Study the Economic, Industrial, Education and Civic Needs of the Negroes of Missouri; he has been assigned to study the health aspect.

ANDREW J. CAUTHEN, M.D.,† of Lake City, S. C., has been appointed Health Officer of Lancaster and Chesterfield Counties.

DR. JOHN M. PRESTON, of Lancaster, S. C., has been appointed head of the Tuberculosis Division of the State Department of Health.

DR. JACK B. EASON, of Yuma, Ariz., has been placed in charge of the State Bureau of Maternal and Child Health.

DR. EUGENE L. WALSH, of Hawkeye, Iowa, has been appointed in charge of the Washington County Public Health Unit, succeeding DR. REGNAR M. SORENSON, of Washington, Iowa.

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* Fellow A.P.H.A.
† Member A.P.H.A.

DR. THOMAS B. MAGATH,† of the Mayo Clinic, has been appointed Health Officer of the City of Rochester, Minn. He succeeds DR. CHARLES H. MAYO,† who has been Health Officer for 25 years.

FRANK W. LAIDLAW, M.D.,* of Middletown, N. Y., has been appointed District Health Director on the staff of the New York State Department of Health.

DR. MILTON W. WILLIAMSON, of Red-boiling Springs, Tenn., recently associated with the Kentucky State Board of Health and formerly with the U. S. Public Health Service, has been named Associate City Health Director of Chattanooga, Tenn.

DR. MALCOLM H. MERRILL, in charge of the syphilis clinic at the University of California Hospital, San Francisco, Calif., has been appointed Chief of the Bureau of Venereal Diseases of the California State Department of Public Health.

DR. WILLIAM ARTHUR SMITH, of San Antonio, Tex., has been appointed Director of Mental Hygiene in the Texas State Department of Health.

DR. CLYDE W. BESON, of Claremore, Okla., former State Health Commissioner, has been appointed Medical Adviser to the State Industrial Commission.

DR. HERBERT R. KOBES, of Augusta, Me., has been placed in charge of the maternal and child health program now being carried out by the Maine State Department of Health with Social Security Funds.

DR. FERGUS O. MAHONY, of El Dorado, Ark., was elected President of the State Board of Health, succeeding DR. WILLIAM G. HODGES, of Malvern.

DR. EDWARD S. SMITH, of Kirksville, Mo., was elected President of the State Board of Health, succeeding DR. TIMOTHY S. BOURKE, of Kansas City.

H. R. Ross, M.D.,† Director of the Division of Child Hygiene in the Kansas State Board of Health, has been appointed acting secretary to succeed EARLE G. BROWN, M.D.,* resigned.

RAGNAR T. WESTMAN, M.D.,† formerly of the Division of Public Health, Minneapolis, and a member of the Educational Staff of the University of Minnesota, has been appointed Director of the newly organized County Health Unit in Bay County, Michigan, effective May 15.

R. C. REHDER, M.D., who has been Assistant Health Officer in Richland County, Ohio, has become County Health Officer, succeeding MILLARD C. HANSON, M.D.,† who is going to Toledo to become City Health Officer there.

GEORGE MCLEAN LAWSON, M.D., DR.P.H.,† Professor of Public Health and Bacteriology at the University of Louisville, School of Medicine, has been appointed to the chair of Preventive Medicine and Bacteriology in the Medical Department of the University of Virginia, Charlottesville, Va.

ROBERT M. BARDIN, M.D.,† of Rutherfordton, N. C., recently Health Officer of Rutherford County, has been appointed Health Officer of Richmond County, to succeed DR. B. B. DALTON,† of Rockingham.

DR. EDMUND G. ZIMMERER, Lincoln, Nebr., has been appointed Assistant Epidemiologist in the State Department of Health to head a division of venereal disease.

DR. BENJAMIN M. BERGER, formerly City Health Officer of Phoenix, Ariz., has been appointed Superintendent of the State Hospital for the Insane at Phoenix, succeeding DR. JAMES R. MOORE.

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* Fellow A.P.H.A.
† Member A.P.H.A.

DR. FRANCIS DE SALVO has been named Health Officer of Niagara, Mich., for two years.

DR. HARRISON EILERS, of Los Lunas, N. M., has been appointed Health Officer of the Eighth District, with headquarters in Los Lunas, succeeding JULIAN O. LONG, M.D.,† of Albuquerque, who went to the Third District in Albuquerque.

JOHN D. DONOHUE, M.D., has been appointed Health Officer of Montville, Conn., to fill the vacancy caused by the death of MORTON E. FOX, M.D.

JOSEPH MAGNANO, M.D., has been appointed Health Officer of Haddam, Conn., to fill the unexpired term of J. E. WALDMAN, M.D.

DR. PEYTON M. CHICHESTER, of Clarendon, Va., Secretary of the Arlington County Board of Health, has been appointed Assistant Director of the Bureau.

DR. WILLIAMSON C. WELBURN, of Arlington, Va., has been appointed Health Officer of Arlington County, to succeed DR. PEYTON M. CHICHESTER, of Clarendon.

DR. WILLIAM A. MITCHELL, of Colfax, Wash., has been appointed Health Officer of Whitman County, Wash., to succeed DR. ROBERT J. SKAIFE.

DR. RUFUS F. PAYNE, of Lebanon, Tenn., has been appointed Health Officer of Tift County, Ga.; he formerly served in a similar capacity in Walker County.

DR. THOMAS C. WATSON, Benton, Ark., has been appointed medical director of the Tenth District, comprising Saline, Hot Springs and Grant counties.

DR. FRANK L. QUILLMAN, formerly of Winter Garden, Fla., has been appointed Health Officer of Orange County, with offices in Orlando.

DR. EOLINE B. CHURCH DUBOIS, Springfield, Mass., has been appointed permanent medical inspector for the local school department.

DR. EDWIN F. DAILY has been named Director of the Division of Maternal and Child Health of the Children's Bureau, Washington, D. C., to succeed ALBERT MCCOWN, M.D.†

DR. JOHN A. SEVIER, of Colorado Springs, Colo., has been elected President of the Colorado Tuberculosis Association.

DEATH

HARRISON PRESCOTT EDDY,* Boston Engineer, and partner in the firm of Metcalf & Eddy which he founded in 1907, died in Montreal on June 15. He was attending the meeting of the Engineering Institute of Canada and was to have been awarded an honorary membership within a few hours. He was 67 years of age.

Mr. Eddy was a specialist in sanitary engineering and consulting engineer to some 75 municipalities on problems of sewage disposal and water supply, and to manufacturers on the treatment and disposal of industrial waste.

He was a member of the Boston Society of Civil Engineers, of which he was president in 1914; of the American Institute of Consulting Engineers, of which he was vice-president in 1926; of the American Water Works Association, the American Public Health Association, the American Chemical Society, the Union and Engineers clubs of Boston, the Engineering Institute of Canada, the Institution of Civil Engineers of London, and the Engineers Club of New York.

Mr. Eddy has been a member of the A.P.H.A. since 1910, and a Fellow since 1924.

* Fellow A.P.H.A.
† Member A.P.H.A.

CONFERENCES AND DATES

American Association of School Physicians. Annual Meeting in conjunction with Annual Meeting of the American Public Health Association. Hotel Pennsylvania, New York, N. Y. October 5–8.

American College of Surgeons. Chicago, Ill. October 25–29.

American Dietetic Association—Twentieth Annual Meeting. John Marshall Hotel, Richmond, Va. October 18–21.

American Hospital Association. Atlantic City, N. J. September 13–17.

American Public Health Association—Sixty-sixth Annual Meeting. New York, N. Y. October 5–8.

American Society of Sanitary Engineers. Washington, D. C. September 7–10.

Association of Dairy, Food and Drug Officials of the United States. Raleigh Hotel, Washington, D. C. October 26–29.

Fifth International Congress of Radiology. Chicago, Ill. Sept. 13–17.

International Association of Milk Dealers. Dallas, Tex. Oct. 21–23.

International Association of Milk Sanitarians. Brown Hotel, Louisville, Ky. October 11–13.

Michigan Public Health Association. Lansing, Mich. November 10–12.

National Association of Educational Broadcasters. Urbana, Ill. September 13–14.

New England Milk Producers Association. Boston, Mass. October 26–27.

New England Sewage Works Association. Worcester, Mass. October 1–2.

New England Water Works Association. Poland Springs, Me., September 21–24.

New York State Association of Dairy and Milk Inspectors. Hotel Utica, Utica, N. Y. September 22–24.

New York State Conference on Social Work. New York, N. Y. October 19–22.

New York State Health and Physical Education Association. Syracuse, N. Y. December, 1937.

Ohio Conference of Sewage Operators. Cincinnati, Ohio. October 19–20.

Ontario Hospital Association. Toronto, Ont. October 21–23.

Pacific Coast Accident Prevention Conference. San Francisco, Calif. September.

Pennsylvania State Organization for Public Health Nursing. Altoona, Pa. October 28.

Rocky Mountain Sewage Works Association. Santa Fe, N. M. September 20–22.

Southern Medical Association. New Orleans, La. November 28.

FOREIGN

International Physiological Congress. Zurich, Switzerland. August 14–18.

World Congress of Universal Documentation. Paris. August 16–21.

International Union Against Tuberculosis. Lisbon, Portugal. September 5–9.

Fourth International Pediatric Congress. Rome, Italy. September 24–30.

Second International Congress for the Protection of Infancy. Rome, Italy. October 4–8.

Congress of Physiologists. Paris. October 11–13.

Institute of Sewage Purification. London. November 19.

Hawaii Territorial Medical Association. Honolulu, T. H. May, 1938.

Gifts and Bequests

The American Public Health Association is the technical society of professional public health workers. It is not endowed. It derives its income from membership fees, its publications and business services, and from grants for special purposes.

As the recognized and respected coördinator and leader of the public health movement on the North American continent, the American Public Health Association offers opportunities of the highest order to those who through financial good-fortune and personal inclination are in a position to make funds available for human welfare.

SUGGESTED FORM OF BEQUEST

I give and bequeath to the American Public Health Association, a corporation organized under the laws of Massachusetts, the sum of.....
to be applied to the protection and promotion of public and personal health under the direction of the said American Public Health Association.